NETWORK WORLD
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Cabletron mgmt. system to control wider Spectrum

BY SKIP MACASKILL

Paris

Cabletron Systems, Inc. this week at INTEROP 93 Europe is expected to announce new features that will enable its Spectrum net management platform to be configured in a more distributed fashion and exchange data with the leading enterprise management systems.

The announcements will fill the second and third phases of Cabletron's three-part open systems network management plan, dubbed Spectrum for Open Systems, which is designed to position Spectrum as a manager of managers.

The first phase was announced at the last INTEROP show in August and included the introduction of Spectrum Portable Management Applications. These applications, which are available now, enable four major management platforms — Hewlett-Packard Co.'s OpenView, IBM's NetView/6000, SunConnect's SunNet Manager

See Cabletron, *page 6*

NetWare users backed up on 4.X deployment

BY CARYN GILLOOLY

Large-scale implementations of Novell, Inc.'s NetWare 4.X are, at least temporarily, on hold.

Many 4.X users who would like to deploy the latest version of NetWare companywide are holding off for fear of disaster because NetWare backup products do not yet fully support 4.X networks.

"Third-party support for 4.X is sorely lagging," said John Shortall, NetWare 4.0 project leader at Air Canada in Montreal. "There's still no backup products out there, and I can't figure out what's holding them up."

While the problem of third-party support for

See NetWare, *page 66*

Industry upheaval sparks change

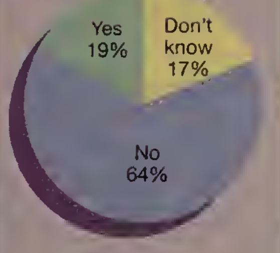
Policy-making process threatens telecom.

BY ALAN PEARCE

For the past 30 years, telecommunications policy-making has been done on a reactive, crisis-by-crisis basis, leading to confusion in the industry and rising concern among users.

The institutions with their fingers in the policy-making pie — the White House, Congress, the courts, the departments of Justice and Commerce, the Federal Communications Commission and state regulators — have been largely disinterested, inept or at odds with one another in trying to establish a vision of the future.

Are policies on track?



Do federal policies governing the RBHCs reflect the current state of the industry?

SOURCE: *NETWORK WORLD*
GRAPHIC BY TERRI MITCHELL

The result: policy-making gridlock, marked by petty squabbles and turf battles among the competing organizations. The rules of the telecommunications game don't match up with today's market and technology imperatives, and they threaten to stall the growth of the network industry and construction of the heralded information superhighway.

Multibillion-dollar mergers and cross-industry partnerships that were unimagined just two years ago are straining the regulatory walls that separate market segments. The innovative new services promised by this market evolution may not be realized if the policy picture isn't sorted out.

ANALYSIS

"Markets and technologies have changed dramatically since the major policies were established," said a senior White House official. "That's why the White House and the 103rd Congress must take a fresh look at the industry and map out a new course — a new vision."

The Communications Act of 1934, careening toward its 60th birthday in June, was drafted long before the influence of users was felt.

See Policy, *page 64*

Users say, 'Turn the Bells loose'

BY BILL BURCH

Washington, D.C.

Free the RBHC Seven.

That's the message from a *Network World* survey of network managers, who said it's time to unshackle the seven regional Bell holding companies from their legal and regulatory restraints. The RBHCs should be allowed to provide interexchange services, manufacture and market network equipment, and provide cable television services in their operating areas, users said.

As a new world order takes shape through mergers such as the AT&T/McCaw

See Bells, *page 64*

NCR expands TCP/IP hooks to SNA nets

BY MICHAEL COONEY

Orlando, Fla.

Trying to shake its image as an SNA also-ran, NCR Corp. is readying a slew of new and improved products that will make it easier for users to access host applications over TCP/IP networks.

Based on information gleaned from presentations at NCR's recent user group meeting here, the products will include a gateway, dubbed Deployer, for linking Unix servers to mainframe channels and a new Transmission Control Protocol/Internet Protocol processing feature for NCR's recently announced 5909 LAN-to-mainframe gateway. TCP/IP enhancements are also forthcoming for the company's 56XX front-end processors (FEP), along with support for frame relay services.

"These products are NCR's way of moving out from under the shadow of IBM and SNA, and saying to users, 'We're going to be your TCP/IP provider,' " said Lucinda Santisario, research manager of computer networking architectures at International Data Corp., a research firm in Framingham, Mass. "They are redefining their role and completely changing their direction."

The first product, the 35XX Deployer, is a high-performance Intel Corp. 80486-based communications gateway that allows up to seven NCR

See NCR, *page 66*

Securities firm to stock up on client/server apps

BY BOB BROWN

New York

Securities firm Cowen & Co. is bullish on client/server computing in more ways than one.

Not only are the company's stock analysts upbeat about the client/server market, but the firm is also committed to migrating its most strategic applications to compete with larger Wall Street firms and to help employees better serve clients.

Cowen has three client/server initiatives in various stages of completion: a stock quote system, a financial and management operations system based on an SQL database, and a research distribution system based on Lotus Development Corp.'s Notes groupware.

Although enthusiastic about the technology, the company is taking an evolutionary approach, said Bill Whelpley Jr., vice president of desktop systems. Whelpley joined Cowen full time about a year ago to improve the quote system's performance and since then has been involved in making all of the firm's client/server applications accessible via an Ethernet backbone.

The first application migrated to client/server was the quote system, which is used to distribute real-time stock, bond, option and futures prices, trading activity data and news to Cowen employees. The system was initially based on service bureau host systems Cowen

See Cowen, *page 4*

STEVE BORNS

"The new applications will increase our productivity."

Cowen & Co.'s Bill Whelpley Jr.

NEWSPAPER

PAGE TWO

Briefs

DEC readies ATM switch. Digital Equipment Corp. this week is expected to fill out its Asynchronous Transfer Mode (ATM) lineup with a new premises switch based on its experimental 12.8G bit/sec AN2 switch.

DEC will also deliver ATM line cards, a Turbochannel bus adapter for Alpha workstations and an ATM line card for the company's GIGAswitch Fiber Distributed Data Interface switch. All the line cards and adapters will support speeds of 155M bit/sec. DEC will also include software for the products, called Switch Master and Flow Master, that provide ATM congestion and flow control, respectively. The products are expected to ship in the first quarter of 1994, sources said. DEC declined to comment.

Novell to chip in for National Semiconductor. National Semiconductor Corp. next week is expected to announce a joint technology and marketing agreement with Novell, Inc. Sources said Nat Semi will bring out a line of Ethernet adapters and plans for a line of hubs. Novell is expected to provide NetWare connectivity directly into the hubs.

HP opens up SNA management strategy. Hewlett-Packard Co. this week will announce that it has licensed Peregrine Systems, Inc.'s OpenSNA software for managing IBM Systems Network Architecture nets. HP will market the Peregrine application, which runs on the HP OpenView management platform, under the name OpenView SNA Node Manager.

The product costs $12,750 for the server piece and $15,000 for agent code that runs on an IBM MVS mainframe. It will be available in the first quarter of 1994.

Change of command at NET. Network Equipment Technologies, Inc. (NET) Chairman and Chief Executive Officer Daniel Warmenhoven last week announced he is resigning effective Dec. 31. Warmenhoven said he had accomplished the primary objectives he established for himself when he assumed leadership of NET three years ago and now wants to pursue new opportunities. According to NET's board of directors, board member John Arnold will act as interim CEO if a new leader is not selected by the end of the year.

Get the skinny on ISDN. The regional Bell holding companies last week released a 50-page document detailing their current tariffs for Integrated Services Digital Network Basic and Primary Interface lines. For more information, call the Bellcore customer relations center at (800) 521-2673.

New fight over Cable Act imminent. The U.S. government, the Federal Communications Commission and U.S. Department of Justice Attorney General Janet Reno jointly filed a motion in U.S. District Court in Alexandria, Va., indicating they will appeal that court's decision of last August that overturned the 1984 Cable Act so that Bell Atlantic Corp. would be allowed to provide cable services.

In the case, Bell Atlantic convinced the judge that the Cable Act ban on the telephone company provision of video programming infringed on Bell Atlantic's constitutional right to free speech.

Sculley goes wireless. Ousted from Apple Computer, Inc. due to bad revenue news, former Apple CEO John Sculley has landed at Spectrum Information Technologies, Inc., a small Manhasset, N.Y.-based company with important patents in the cellular field. Sculley, now chairman and CEO at Spectrum, will assist the company in licensing negotiations. Spectrum has already signed patent agreements with AT&T and Rockwell International, Inc. for use of Spectrum technology.

Contacts

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Network HELP *desk*

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467 or via the Internet at djt@world.std.com.*

We recently converted our networks from 3Com Corp. 3+ to Novell, Inc. NetWare 3.11. According to a Novell white paper dated September 1991, Novell was to develop a conversion kit for the 3S/400 series servers to run NetWare. Can you tell me if the conversion kit is available, and if so, how I can go about getting it?

Ronald Stokes, Alexandria, Va.

Eric Brad, director of engineering services at International Micronet Systems, Inc., a San Francisco-based systems integrator, replies:

A 3+ to NetWare Migration Kit is indeed available for migrating your 3Com network to a NetWare 3.11 network. The upgrade program allows 3Com owners a single upgrade for each 3Com server license. Prices for upgrading from 3Com 3+Share software range from just over $1,000 to almost $10,000, depending on the user licensing of the 3+Share you own and the desired licensing for NetWare users.

Network World *contacted Novell and found the 3+ to NetWare Migration Kit is available through Novell's After Market Products. To get additional product information, call (800) 346-7177.*

I am looking for a middleware product or a development tool that will allow me to write a bar code, shop-floor data collection application to run on a personal computer or Unix system, and interface to the RMS files used by the manufacturing application on my VAX. Can you help?

Jim Peden, Westminster, Colo.

Don Kretz, president of Eaglesoft Corp., a Seattle-based company providing open systems warehouse and distribution applications, replies:

There are three basic types of bar code data

See **Help desk**, *page 53*

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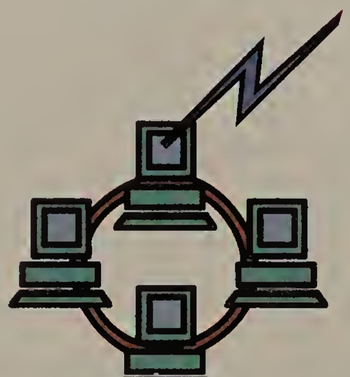

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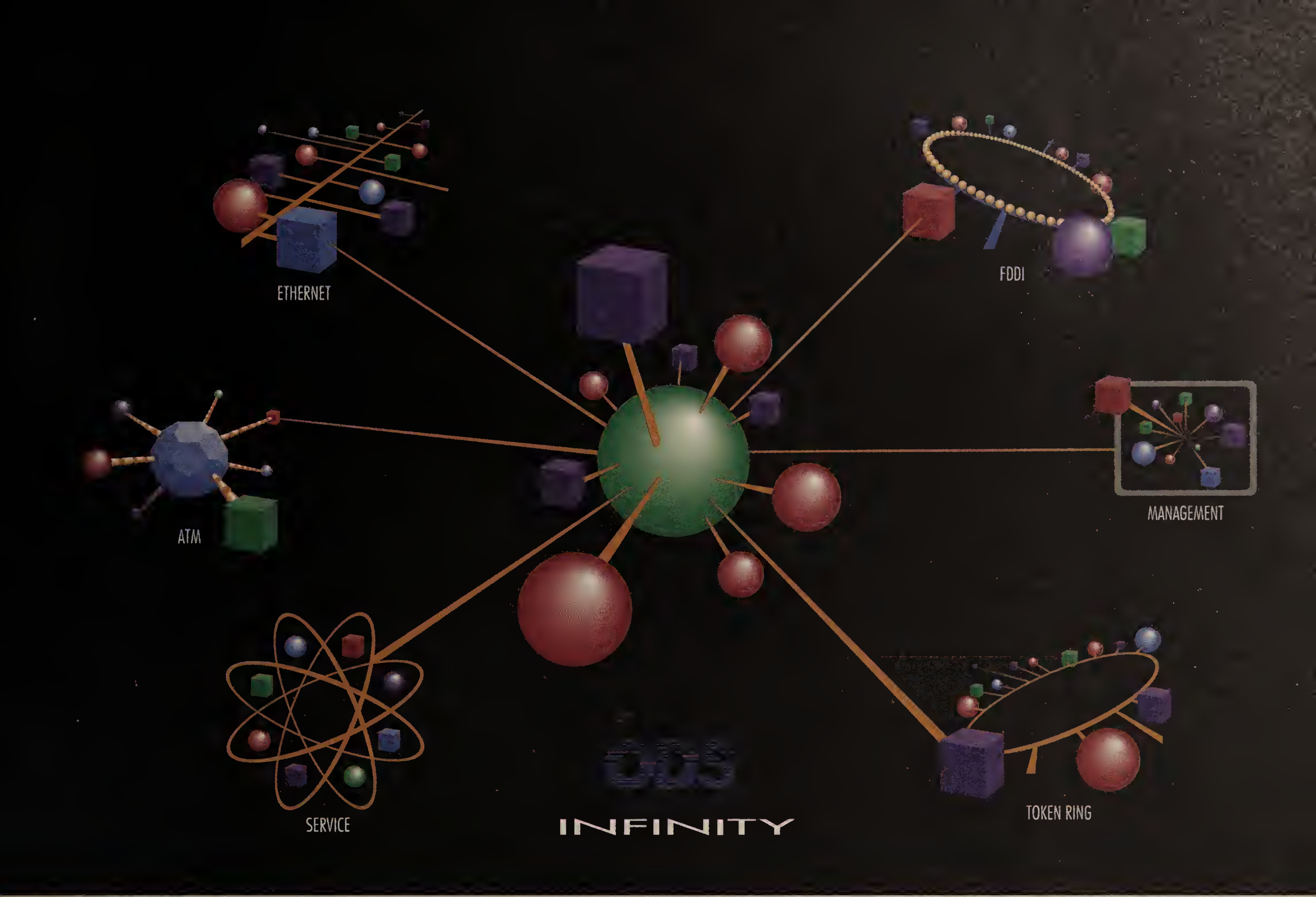

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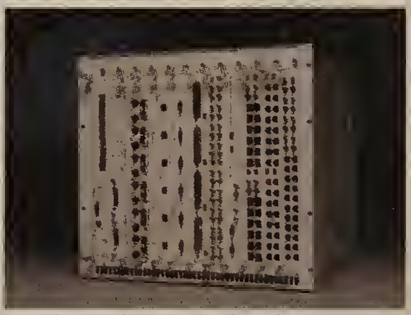

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Cowen

Continued from page 1

employees accessed via terminals.

Cowen has migrated away from that system over the past two years to a local network anchored by four NCR Corp. StarServer E Unix servers that process data feeds from various on-line information services. These servers forward the data to a proprietary database supported by four other StarServer E systems.

The database can be accessed by terminals and personal computers attached to 25 networked Unix quote servers that support terminals and, through emulation sessions, PC workstations.

Now Cowen is rolling out a series of advanced client/server applications for the PCs so they can make better use of the stock quote and other data streaming into the company.

One application lets end users create charts depicting the stock performance of specific firms over slices of time. The database servers provide the raw data, while the PC application software lets users create charts and manipulate data in ways they cannot using terminals.

"The biggest benefit of client/server computing is that we are putting the power of information and the ability to manipulate information into the hands of the people who best know how to use it," according to Whelpley.

FAMILY JEWELS

Another client/server effort is based on the company's Sybase, Inc. SQL Server database, which runs on a Sun Microsystems, Inc. server and handles the company's daily financial and management operations data, including information on trades — who made them and commissions earned. The server has been running in production mode for about eight months.

The database server is designed to collect daily event summaries over an Ethernet link from Cowen's Tandem Computers, Inc. NonStop minicomputer, which is used to process stock trades and handle other applications Whelpley referred to as "the family jewels."

The database server is then able to process requests made by end users equipped with popular spreadsheets or other PC-based applications with SQL access. Managers are able to measure the performance of individual traders and departments of traders, among other things using such applications.

"There is a great deal of power in having that information accessible to the management," Whelpley said. "The drawback, sometimes, is security."

While the SQL Server system has great promise, Whelpley said there is no practical way to move its trading system off the fault-tolerant Tandem host.

The third major project involves deployment of NetFRAME Systems, Inc. superservers at sites across the company to act as file servers for Cowen's general PC population.

The servers are running Microsoft Corp.'s LAN Manager 2.1, Notes and several other applications.

Cowen is rolling out Notes servers to store and distribute information that is generated by the company's technology and health care stock research group based in Boston. The research is entered via PCs, compiled on a Notes server in Boston and then replicated to a Notes server in New York, which can be accessed by various network users.

The application is being used, for example, to provide Cowen's large institutional investors with up-to-date information on securities followed by Cowen analysts. Previously, the research was available only on paper, Whelpley said.

Whelpley's plan is to provide varying degrees of access to the client/server applications on an individual and business group basis.

While some end users and organizations may need to access just the quote system, others, such as investment banking, may need access to all three systems from multiple locations.

Lotus, Gupta to meld Notes, SQL database tools

BY WAYNE ECKERSON

Cambridge, Mass.

Lotus Development Corp. and Gupta Corp. this week will announce here a joint development effort that will result in the integration of Lotus Notes and Gupta's popular SQLWindows and Quest application development tools.

According to sources, Gupta will develop an interface between SQLWindows and the Notes application program interface (API) that will let SQLWindows developers and end users take advantage of Notes' work group capabilities, such as document sharing, messaging, work flow automation, replication and forms-routing.

PAPOWS

In addition, Gupta will build an interface between Notes and Quest, Gupta's data access and query tool for nonprogrammers, which will enable Quest users to access data in Notes databases.

The move is drawing praise from users who have been pushing Lotus to open up Notes to work with third-party development and query tools.

"This is of paramount importance to me," said Tim Deagan, manger of information delivery technologies at Dell Computer Corp. in Austin, Texas. "One thing that has kept Notes from playing a larger role in our organization is that it is difficult to get data out of Notes using standard SQL calls."

Most companies have deployed Notes in pockets throughout an organization, but now want to integrate it with other applications and combine Notes data with SQL and legacy data.

Jeff Papows, head of the Lotus Notes division, and Umang Gupta, president of Gupta, will describe the companies' partnership tomorrow here.

Gupta plans to use Notes to extend the capabilities of the SQLWindows 4.0 repository, which lets teams of programmers on a local-area network develop applications. The repository contains source code, project data as well as other information relevant to the application development process.

Notes-enabled SQLWindows allows companies to create an enterprisewide SQLWindows repository. Data in the repository could be shared with developers anywhere in the world via Notes replication. Development teams could automatically route project updates and work to appropriate individuals using Notes work flow capabilities. The development process could also be enhanced using Notes document imaging, messaging, facsimile, forms routing and other capabilities.

A source at Gupta said Notes-enabled SQLWindows provides the precise capabilities Gupta was looking to add to the product in the next year or two. "We don't have a mail system or forms routing; that's why we are partnering with Lotus," the source said.

DATA INTEGRATION

Users also want to access Notes data from third-party tools and combine it with data from legacy systems and SQL databases. Currently, Lotus only supports a unidirectional flow of data from external sources into Notes via Lotus DataLens and Microsoft Corp.'s Open Database Connecivity (ODBC).

To move Notes data into other applications, developers must use the Notes API, which is time-consuming and difficult. Deagan said his development team spent many man-hours customizing an internal application to be able to access Notes data via the Notes API.

GUPTA

The partnership with Gupta, however, is not the only solution Lotus will offer for exporting Notes data to other applications.

Early next year, Lotus will ship a Microsoft ODBC driver that will enable ODBC-compliant applications to access Notes data. Lotus also recently demonstrated a client/server development tool, called Notebook, that will enable developers to build graphical applications that can query data from Notes and SQL databases.

In addition, a Lotus spokesperson said Lotus will seek to partner with any client/server tool vendor who wants to more tightly integrate their tools with Notes.

By seeking a plethora of partners, Lotus is repeating the model it has used to add work flow and other additional capabilities to Notes. According to the model, Lotus will develop baseline functionality that is available to all Notes users. It then builds on the baseline by teaming with third parties who can add special expertise to the Notes environment.

In the client/server development arena, Lotus Notebook will offer the baseline features, and Gupta and other tools vendors will provide the robust add-on features.

TROUBLE TICKETING

Remedy upgrades trouble-ticket application

BY JIM DUFFY

Mountain View, Calif.

Remedy Corp. last week rolled out a new version of its automated trouble-ticket system that features enhanced work flow and data access capabilities, as well as support for Windows clients.

Release 1.2 of Remedy's Action Request System trouble-ticket application will allow users to quickly gather more information when filling out network management trouble tickets. A new Windows client software package, Action Request System for Windows 1.1.5, will allow users to deploy the Remedy application on non-Unix clients for the first time.

The Action Request System currently runs on Unix clients and servers as a stand-alone trouble-ticketing system or as an application on an enterprise management platform.

When a faulty net device generates an alarm, the Action Request System opens a trouble ticket and populates it with data on the device from the system's database. The Remedy system then routes the trouble ticket to the appropriate net technician or prompts a net management system to issue a remedial command. Trouble-ticketing systems are common in help desk environments.

Release 1.2 allows users to group as many as three incidents in a single trouble-ticket report.

"We want to own the internal help desk," said Remedy Chief Executive Officer Lawrence Garlick, referring to corporate net management operations.

Release 1.2 of the Action Request System may hold the deed. Release 1.2 allows users to group as many as three incidents in a single trouble-ticket report. It also enables faster selection of problem fixes and names of support personnel from a database that houses such information.

The new version of the trouble-ticketing system also includes a feature that automates the process of filling out a trouble ticket based on the incident. When an incident occurs regularly, a user can store the trouble-ticket information in a file on the Remedy server. When the incident occurs again, the users can open a trouble ticket and automatically populate it by clicking on that file.

For work flow, Release 1.2 allows users to create and prioritize a series of actions to be taken based upon specific network events. For example, using macros, users can program a trouble ticket to gather data from certain databases and route the ticket to specific help desk personnel based on the network event, time of day, etc. Release 1.2 costs $6,500. It will be available by year end.

The Windows version of the trouble-ticketing system allows users to open and work on multiple tickets simultaneously. Users also can pull up data from multiple databases while working on a trouble ticket.

Version 1.1.5 supports Transmission Control Protocol/Internet Protocol transports from FTP Software, Microsoft Corp.'s LAN Manager, Novell, Inc.'s LAN WorkPlace, SunSoft, Inc.'s PC Network File System and NetManage, Inc.'s Chameleon. It costs $500 and is available now.

Meanwhile, Remedy said the Action Request System will support Apple Computer, Inc. Macintosh clients and ASCII terminals by year end. Those products will cost $500 each.

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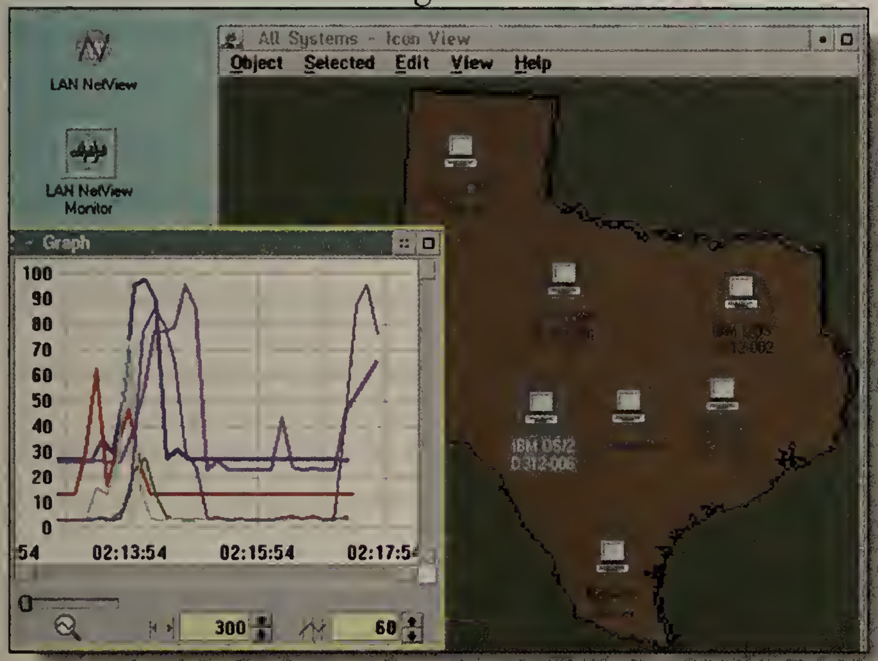

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ODMG issues spec

BY WANYE ECKERSON

Tokyo

BARRY

If imitation is the sincerest form of flattery, vendors of object-oriented database management systems last week paid respect to their counterparts in the relational world by publishing a standard interface to access object databases.

Just as SQL provides a standard method for accessing multivendor relational databases across a network, the new specification does the same for object databases. The specification is designed to foster application portability by letting users swap out object databases without significantly rewriting applications.

The 90-page ODMG-93 specification was hammered out by the Object Database Management Group, Inc. (ODMG), a vendor consortium formed two years ago to develop the object database equivalent of SQL. The members of ODMG are O^2 Technology, Objectivity, Inc., Object Design, Inc. (ODI), Ontos, Inc. and Versant Object Technology, Inc.

"This will make life much easier," said Steve Hares, principal software architect at Passage Systems, Inc., which makes a document management system that incorporates Versant Object Technology's object database. "We can switch object databases without changing our programs."

The members of ODMG, most of which are small, relatively young companies, banded together and created a portability standard in hopes of expanding the object database market.

ODMG members

O^2 Technology
Objectivity, Inc.
Object Design, Inc.
Ontos, Inc.
Versant Object Technology, Corp.

ODMG-93 specification reviewer members:

Digital Equipment Corp.
Hewlett-Packard Co.
Intellitic International, Inc.
Itasca Systems, Inc.
POET Software Corp.
Servio Corp.
Texas Instruments, Inc.

SOURCE: OBJECT DATABASE MANAGEMENT GROUP, (ODMG) BURNSVILLE, MINN.
GRAPHIC BY SUSAN J. CHAMPENY

Seven other companies, including Servio Corp. and Intellitic International, helped review the specification as it was being developed and provided feedback to the core ODMG members.

Most of the reviewer members have verbally committed to supporting the ODMG specification, according to Rick Cattell, distinguished engineer at SunSoft, Inc. and founder of ODMG.

The ODMG-93 standard will make it easier for users to buy object databases knowing they can switch vendors easily if business requirements change or their vendor goes out of business.

"The interface will give customers a sense of safety that they are not being locked into using a single vendor's database, allowing the industry as a whole to grow," said Ian Schmidt, director of product marketing at ODI in Burlington, Mass., the market-leading object database vendor.

CATTELL

WHAT'S INSIDE

The specification defines an object model, an object query language, object bindings or interfaces for C++ and SmallTalk object-oriented programming languages and an object definition language (ODL) based on the Object Management Group's (OMG) Interface Definition Language.

Essentially, the specification defines extensions to C++ and SmallTalk that provide seamless bindings to object databases. The specification defines new C++ and SmallTalk commands, such as COMMIT, that are required to query databases. This allows programmers to develop database programs without learning a new language or application program interface, as is the case with SQL.

ODMG has based most of its work on standards defined by the OMG and will continue to modify the ODMG specification to conform with evolving OMG standards. Eventually, ODMG will submit its specification to OMG for adoption as OMG's object querying and replication services.

Doug Barry, executive director of ODMG, said the ODMG interface contains more than half of all functions found in ODMG members' database products.

"It's a major subset," he said. However, there are features specified in the standard, such as versioning and various querying functions, that some vendors do not support, he said.

All ODMG members declared their intent to support the standard by the end of 1994. ODI, for example, said it needs to create a preprocessor to handle the new interface and modify its query language to support ODL.

Jacob Stein, an independent consultant in Oakland, Calif., said most object database vendors will first try to conform to ODMG's ODL data definition language, which is used to design databases. This will provide database portability, allowing users to move from one database to another without changing data models.

After that, vendors will implement ODMG's query and data manipulation language.

This will give users the ability to use the same commands to create, query, update and delete different vendors' databases.

Barry said ODMG vendors are discussing a vendor certification program, but he would not say if and when such a program would be established.

The specification is available in technical bookstores for $32.95. It can also be obtained by calling the publisher at (800) 745-7323.

©ODMG: (612) 953-7250..

Cabletron

Continued from page 1

and Novell, Inc.'s NetWare Management System (NMS) – to manage Cabletron's line of hubs, bridges, adapter cards and other network products.

Now in the second phase, Cabletron will roll out Spectrum Data Gateways, a series of applications that put Spectrum in the manager of managers role over the competing platforms, enabling it to aggregate alarms, monitor threshold levels and synchronize management databases.

"With these software gateways, Spectrum can be used to monitor the health of these platforms and the networks attached to them," said Mike Skubisz, director of product marketing at Cabletron. "The gateways allow Spectrum to go into these platform databases and siphon off management information that was compiled by the platform system through polling."

"With these software gateways, Spectrum can be used to monitor the health of these platforms and the networks attached to them."

These capabilities are made possible through the use of published application program interfaces, allowing net managers to monitor and control a wide range of devices from one console.

The applications may give Spectrum an edge over other platform systems that cannot retrieve data from disparate management systems, said John McConnell, a Boulder, Colo.-based independent analyst specializing in net management.

"These data gateways are attractive because they don't require a user to ditch their [existing platform] investment," McConnell said. "Spectrum is not displacing these other platforms. It's merely leveraging their features and information, which gives the net manager one clear view of the network."

The Spectrum Data Gateway applications will ship by the first quarter of next year. Pricing has not yet been determined.

In the second quarter of 1994, Cabletron will address the third phase of its net management plan when it rolls out Spectrum Version 3.0.

The upgraded version will enable a series of SpectroServers to do polling and threshold monitoring of regional nets, allowing net management to be geographically dispersed.

These SpectroServers, which are actually Unix workstations, can be used to monitor and control these regional nets, relaying pertinent information such as alarms back to Spectrum at corporate headquarters. Spectrum will also have direct access to the SpectroServer, allowing Spectrum to transparently control and monitor those nets if needed.

This distributed ability will be critical to Cabletron's success with this manager of managers approach, according to McConnell. "If Cabletron can get this client/server distributed architecture to process management information locally, then there might be a chance to achieve the manager of managers goal for Spectrum," he said.

Pricing for Spectrum 3.0 has not yet been determined.

©Cabletron: (603) 332-9400.

ISDN standards scandal alleged

BY BILL BURCH

Washington, D.C.

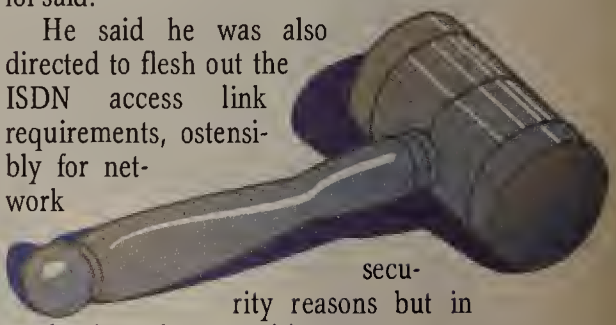
An ex-Bell Communications Research engineer has accused his former employer and the seven regional Bell holding companies of conspiring to retain monopoly control of local Integrated Services Digital Network access.

"I was directed to, and I did, conspire with my Bellcore management, and conspire jointly also with members of each of the RBOCs, to provide the technical means necessary to leverage monopoly voice telecommunications access to create monopoly local access to ISDN," Richard Taylor told U.S. District Court Judge Harold Greene.

"I was directed to, and I did, conspire with my Bellcore management, and conspire jointly also with members of each of the RBOCs," said Richard Taylor.

In a deposition on Nov. 19, 1992, Taylor claimed Bellcore and the RBHCs conspired to replace a pair of American ISDN standards with a CCITT standard that was designed for monopoly service providers, such as Europe's post, telegraph and telephone administrations. The result, ANSI ISDN standard T1.602, is written to make "unfair and otherwise unnecessary" demands of the service providers, ensuring that only carriers with the resources of the Bell operating companies can offer ISDN access, Taylor said.

He said he was also directed to flesh out the ISDN access link requirements, ostensibly for network security reasons but in truth to impede competition.



In response to the deposition, Greene on Oct. 15 requested the Justice Department to investigate Taylor's allegations and report back within 120 days. "The allegations contained in Mr. Taylor's affidavit, if true, would raise significant concerns about compliance with previous orders of this Court," Greene wrote.

In a terse statement, Bellcore said it is aware of Taylor's accusations. The research consortium claims to have "acted lawfully at all times, both as a corporation and through its employees," and pledged cooperation with the Justice Department.

An officer of the Alliance for Telecommunications Industry Solutions' T-1 committee, which handles ISDN standards development work, said the adoption of a CCITT standard would be in keeping with efforts to adopt domestic standards that are consistent with international standards.

"I'm confident T-1 has operated with the highest of ethics," said Jerry Petersen, vice-chairman of the T-1 committee.

Among the RBHCs reached for comment, Bell Atlantic Corp. said it had little to offer regarding the allegation, except to point out that the ISDN standards process is an open forum accessible to all parties.

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

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NWR2

Circle Reader Service #15

StrataCom to unveil souped-up BPX switch at INTEROP Europe

BY MAUREEN MOLLOY

Paris

StrataCom, Inc. this week will officially release its broadband Asynchronous Transfer Mode (ATM) switch along with additional features and a lower price tag than originally planned.

The 9.6G bit/sec Broadband-PX (BPX) switch, to be unveiled at the INTEROP 93 Europe exhibition here, will support connection management and class-of-service capabilities that are expected to boost network efficiency and predictability. Furthermore, the BPX switch will be priced from $27,500 — almost three times less than the $75,000 StrataCom estimated when it announced the product (*NW*, Jan. 11, page 1).

According to Tom Nolle, president of CIMI Corp. in Voorhees, N.J., the new BPX features will provide real-world answers to nagging ATM questions.

"Unlike most vendors that are principally doing a positioning job with ATM, StrataCom has actual orders for this device, which has forced them to look seriously at early ATM issues," Nolle said. "The new announcements include a refined feature set for the BPX that addresses these very real ATM issues."

The first new feature, dubbed AutoRoute, is connection management software that chooses the optimum path through an ATM net based on criteria such as traffic type and preferred routing requirements. After the net operator specifies the source and destination ports of a given connection plus the class of service required, AutoRoute does the rest, obviating the need to manually configure the path on each switch between the source and destination nodes.

AutoRoute also provides the core functionality necessary to support switched virtual circuits (SVC), which requires the class of service associated with a route to be identified before a call setup is performed. Although SVCs are not presently offered by carriers, an AutoRoute concept is the first step toward achieving SVC ATM service, Nolle said.

A second new feature for the BPX switch, OptiClass, is intended to better ensure the predictability of various traffic types traveling over the network by providing 32 different classes of service. OptiClass supports eight times as many class-of-service levels as that specified by the ATM standard, letting users better define service parameters required for different applications, including local-area network, IBM Systems Network Architecture data and video.

AutoRoute and OptiClass will work hand-in-hand with ATM ForeSight, StrataCom's earlier announced bandwidth management feature that allows permanent virtual circuits to burst above their committed information rates to take advantage of idle trunk bandwidth.

All three net optimization tools are available now as optional features of the BPX.

Also this week, StrataCom will unveil an ATM interface for its narrowband IPX switch that will allow the device to be linked to the BPX and any other standards-based ATM switch at T-3 speeds.

Connecticut-based utilities giant Northeast Utilities will become the first user to deploy the BPX in a private network.

John Boyd, Northeast Utilities' communications director, said the company's recent acquisition of N.H.-based Public Service, Inc. has doubled bandwidth requirements during the past year.

With more than 30,000 phone calls an hour to be handled during peak periods and a dramatic escalation of videoconferencing, imaging and frame relay applications, Boyd said he chose the BPX, in part, to accommodate congestion management and class-of-service requirements.

"We're running the corporate net larger and flatter, and we need the tools in place [such as the BPX] that will let us accomplish that without degrading the service levels our end users are accustomed to," he said.

©StrataCom: (408) 294-7600.

BPX at a glance

- Aggregate capacity of 9.6G bit/sec
- Maximum of 96 ports
- Wide-area links of up to 620M bit/sec
- 12 slots, each with total capacity of 800M bit/sec
- Interfaces supported: T-1, T-3, 45M bit/sec frame relay, Synchronous Optical Network, Asynchronous Transfer Mode

BPX = Broadband-PX

SOURCE: STRATACOM, INC., SAN JOSE, CALIF.

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1 Industry: (check one only)

01. ☐ Manufacturers (other than Computer/Communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade/Business Services
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
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13. ☐ Government, State/Local
14. ☐ Government, Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (Independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/VAN/ Systems Houses
22. ☐ Distributors, Computer Related
23. ☐ Distributors, Communications Related
24. ☐ Other____________________

2 What is your job function? (check one only)

NETWORKING MANAGEMENT
1. ☐ Networking Mgmt.
2. ☐ LAN Mgmt.
3. ☐ Datacom/Telecom Mgmt.
4. ☐ Engineering Mgmt.

MIS MANAGEMENT
5. ☐ MIS, IS, IT Mgmt.
6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT
7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)
8. ☐ Consultant (Independent)
9. ☐ Other____________________

3 My responsibilities include: (check one only)

1. ☐ LANs/ Internetworking/ WANs
2. ☐ LANs/ Internetworking
3. ☐ LANs
4. ☐ WANs
5. ☐ None

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9.
6. ☐ 1
7. ☐ None

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope (check one only)
1. ☐ Corporatewide
2. ☐ Multienterprise (consultants)
3. ☐ Departmental

B. Involvement (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate

4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

Involved A | Plan to Purchase B

A B **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ LAN Servers
☐ 03. ☐ LAN Operating Systems Software
☐ 04. ☐ Superservers
☐ 05. ☐ Data Base Servers (Oracle, Sybase, etc).
☐ 06. ☐ Terminal Servers
☐ 07. ☐ LAN Services
☐ 08. ☐ LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
☐ 09. ☐ Network Test Equipment
☐ 10. ☐ Hubs
☐ 11. ☐ Cables, Connectors, Baluns
☐ 12. ☐ UPS
☐ 13. ☐ Network Adapter Boards
☐ 14. ☐ Peer-to-Peer LANs
☐ 15. ☐ Wireless LANs
☐ 16. ☐ SNMP Network Management
☐ 17. ☐ ATM (Asynchronous Transfer Mode)

A B **INTERNETWORKING**
☐ 18. ☐ Bridges
☐ 19. ☐ Routers
☐ 20. ☐ Gateways
☐ 21. ☐ Bridge/Routers
☐ 22. ☐ Hubs
☐ 23. ☐ Intelligent Hubs
☐ 24. ☐ Communications Servers

Involved A | Plan to Purchase B

A B **COMPUTERS/PERIPHERALS**
☐ 25. ☐ Micros/PCs
☐ 26. ☐ Minis
☐ 27. ☐ Mainframes
☐ 28. ☐ Pen-Based
☐ 29. ☐ Laptops
☐ 30. ☐ Workstations
☐ 31. ☐ Image Processing Workstations
☐ 32. ☐ Front-End Processors
☐ 33. ☐ Terminals
☐ 34. ☐ Printers
☐ 35. ☐ Cluster Controllers
☐ 36. ☐ Fax Machines
☐ 37. ☐ X-Terminals

A B **SOFTWARE/APPLICATIONS**
☐ 38. ☐ Network Management
☐ 39. ☐ Micro to Mainframe
☐ 40. ☐ Security
☐ 41. ☐ Communication/Terminal Emulation
☐ 42. ☐ Word Processing
☐ 43. ☐ Operating Systems
☐ 44. ☐ Business Applications (Finance/Mfg/HR)
☐ 45. ☐ Applications Development
☐ 46. ☐ Data Base Management
☐ 47. ☐ Spreadsheet
☐ 48. ☐ Groupware
☐ 49. ☐ EDI
☐ 50. ☐ E-Mail
☐ 51. ☐ Windows/Graphical User Interface
☐ 52. ☐ 4GL/Development
☐ 53. ☐ Multimedia
☐ 54. ☐ Graphics
☐ 55. ☐ Utilities

A B **WIDE-AREA NETWORK EQUIPMENT/SERVICES**
☐ 56. ☐ Modems (9.6K bps and over)
☐ 57. ☐ Modems (under 9.6K bps)
☐ 58. ☐ T-1
☐ 59. ☐ T-3
☐ 60. ☐ Fractional T-1
☐ 61. ☐ Data Switches
☐ 62. ☐ SMDS
☐ 63. ☐ ATM (Asynchronous Transfer Mode)
☐ 64. ☐ Matrix Switches
☐ 65. ☐ Packet Switches
☐ 66. ☐ Protocol Converters
☐ 67. ☐ Diagnostic/Test Equipment
☐ 68. ☐ DSU/CSUs
☐ 69. ☐ Microwave
☐ 70. ☐ Fax Boards/Modems
☐ 71. ☐ VSAT
☐ 72. ☐ Fiber Optic
☐ 73. ☐ Satellite
☐ 74. ☐ ISDN
☐ 75. ☐ PBXs (over 1000 lines)
☐ 76. ☐ PBXs (under 1000 lines)
☐ 77. ☐ Automatic Call Distributors
☐ 78. ☐ Voice Messaging Systems
☐ 79. ☐ Videoconferencing Systems
☐ 80. ☐ Voice Response/Processing
☐ 81. ☐ Switched Voice
☐ 82. ☐ Dedicated Leased Line
☐ 83. ☐ Switched Data
☐ 84. ☐ Centrex
☐ 85. ☐ E-Mail/On-Line Information
☐ 86. ☐ Image Processing
☐ 87. ☐ Audio Teleconferencing
☐ 88. ☐ Local Services
☐ 89. ☐ WATS MTs
☐ 90. ☐ International
☐ 91. ☐ Virtual Networks
☐ 92. ☐ Frame Relay
☐ 93. ☐ Value Added Services
☐ XX ☐ None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	LANs A		Workstations/ Nodes B
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or Less	☐

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES
Present Planned
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25

Present Planned
☐ 07. ☐ NOVELL IPX/SPX
☐ 08. ☐ APPC/APPN/LU 6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ OTHER____________________

LAN OPERATING SYSTEM
☐ 13. ☐ LOCALTALK (APPLETALK)
☐ 14. ☐ BANYAN (VINES)
☐ 15. ☐ DCA (IRMALAN)
☐ 16. ☐ DCA (10-NET)
☐ 17. ☐ IBM (LAN SERVER)
☐ 18. ☐ IBM (PC LAN PROGRAM)
☐ 19. ☐ MICROSOFT (LAN MANAGER)
☐ 20. ☐ UNGERMANN-BASS (NET/1)
☐ 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
☐ 22. ☐ PROTEON (PRONET)
☐ 23. ☐ SITKA (TOPS)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ OTHER____________________

LAN ENVIRONMENT
☐ 29. ☐ 4M TOKEN RING
☐ 30. ☐ 16M TOKEN RING
☐ 31. ☐ ARCNET
☐ 32. ☐ ETHERNET
☐ 33. ☐ STARLAN
☐ 34. ☐ FDDI
☐ 35. ☐ LOCALTALK
☐ 36. ☐ 10BASE-T
☐ 37. ☐ OTHER____________________

OPERATING SYSTEM
☐ 38. ☐ DOS
☐ 39. ☐ UNIX/XENIX/AIX
☐ 40. ☐ OS/2
☐ 41. ☐ OS/2 2.X
☐ 42. ☐ MVS
☐ 43. ☐ VM
☐ 44. ☐ VMS
☐ 45. ☐ MACINTOSH
☐ 46. ☐ WINDOWS
N/A 47. ☐ WINDOWS NT
☐ 48. ☐ X WINDOWS
☐ 49. ☐ OTHER____________________

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER__________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A B
☐ 1. ☐ $100 million and over
☐ 2. ☐ $50 - $99.9 million
☐ 3. ☐ $25 - $49.9 million
☐ 4. ☐ $20 - $24.9 million
☐ 5. ☐ $10 - $19.9 million
☐ 6. ☐ $5 - $9.9 million
☐ 7. ☐ $1 - $4.9 million
☐ 8. ☐ $500,000 - $999,999
☐ 9. ☐ $499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ $1 to $9.9 billion
3. ☐ $500 to $999.9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million
8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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GLOBAL SERVICES

Infonet to extend TCP/IP access

BY BOB WALLACE

El Segundo, Calif.

Infonet Services Corp. this week will announce support for dial-up access to its Infolan router-based LAN interconnection service.

The new Infolan Switched Access Service enables users at remote sites to establish analog modem links to Infolan at speeds up to 14.4K bit/sec.

Previously, the Transmission Control Protocol/Internet Protocol net was accessible only via T-1 links.

Infolan Switched Access Service is generally available now in 30 locations around the world. Infonet is offering usage-based pricing for the service, which supports 9.6K and 14.4K bit/sec switched access speeds — far less than native local-area network speeds but suitable for applications such as electronic mail where speed is less critical.

"There's strong demand for this capability because there's no affordable way to extend access to [midsize and small] sites and end users," said Mark Winther, vice president of electronic communication services with Link Resources Corp., a New York consulting firm. "The market for these services is growing rapidly."

Infolan's Switched Access Service is accessible in the U.S. from cities including Atlanta, Boston, Chicago and Dallas. Internationally, it can be accessed from major cities including Amsterdam, the Netherlands; Barcelona, Spain; Berlin; Brussels, Belgium; Copenhagen, Denmark; Helsinki, Finland; Munich, Germany; Paris; and Stockholm, Sweden.

SOURCE: INFONET SERVICES CORP., EL SEGUNDO, CALIF.

Analysts said the service is likely to be attractive to multinationals that have satellite facilities not connected to Infolan.

The new service enables users to access the Infolan net by dialing in to a local Telebit Corp. NetBlazer dial-up router at the nearest Infonet point of presence.

The user is prompted for an identification code and password, both of which are verified against a Cisco Systems, Inc. router table on the edge of the Infonet backbone network. The user can then exchange data over the net with remote sites.

Sun Microsystems, Inc., Sybase, Inc. and Informix Software, Inc. are among the first users of the service.

"We see this as an important way to let employees at home and on the move easily access resources at large sites," said Sam Rangole, a network manager at Sun. "This would be particularly useful for E-mail."

Infolan Switched Access Service also could be used as a means of backing up a dedicated access line if it was knocked out, an Infonet spokesman said.

"We're also giving all our clients an option for immediate backup in disaster recovery situations," he said.

©Infonet: (310) 335-2600.

Bellcore gives RBHCs ATM specs

BY BOB WALLACE

Red Bank, N.J.

Bell Communications Research last week announced specifications that the regional Bell holding companies can use to offer consistent Asynchronous Transfer Mode (ATM)-based services.

The Bellcore technical references delineate an intercarrier interface for linking local- and wide-area ATM services. The specifications also detail how T-1 can be used to access ATM service and determines the number of virtual paths that can be supported by ATM permanent virtual circuits.

"These documents present a standard description of all the service basics that are needed to support interoperable end-to-end ATM services," said Tom Nolle, president of CIMI Corp., a Voorhees. N.J., consulting and research firm. "ATM service could some day be offered just as T-1 is today."

According to Marty Kilby, Southwestern Bell Corp.'s area manager for product development, "The documents will lead to [ATM] service consistency, which means that a customer can buy ATM service for locations across the nation and have them work together. We don't want users to buy what could be totally different ATM services."

Jose Verger, Pacific Bell's ATM product manager, echoed Kilby's comments. The specs "give us guidelines that will let us work with other carriers and equipment vendors to offer complete ATM service."

Pacific Bell was among the first of the RBHCs to detail its ATM service plans. It will begin offering the service in the San Francisco Bay area by year end and in Southern California in the first half of 1994.

INTERFACE SPEC

One Bellcore document specifies an intercarrier interface that would enable users to install ATM links comprising local and long-haul carrier ATM segments.

"Specifications like those developed by the ATM Forum provide options and don't nail down specific service characteristics," Nolle said. "Carriers could choose to support options that would make their networks dissimilar."

Ken Hand, Bell Atlantic Corp.'s cell relay service product manager said this document is necessary if ATM is to be a national service. Bell Atlantic hopes to offer ATM service in 1994.

"They're critical because, if adhered to, users could be offered end-to-end ATM services," said Chris Heckart, WilTel's manager for broadband services.

Heckart said users would find local exchange ATM services an affordable, flexible and reliable means to access ATM services from long-haul carriers. "T-3 is expensive and anything but ubiquitous," Heckart said. "ATM service will cost less and be more reliable."

Even though AT&T has not announced its ATM service yet, Dave Nelsen, AT&T's ATM service product manager, said, "We're excited about the interface and will meet with Bellcore's top people this week to discuss it. It [will] provide users a great way to access our ATM service."

The Bellcore documents also specify how local carriers can offer T-1 services as a way for users to access 45M bit/sec ATM services. Low-speed ATM access could make ATM affordable to those that cannot cost-justify T-3 access links.

"This is the first time that anyone has taken steps to address the need for sub-T-3 ATM," Nolle said. "Carriers have kept quiet on this topic, while users have continued to ask for it."

And finally, the Bellcore documents specify how many virtual paths should be supported in ATM permanent virtual circuits. It says a T-1 link should support 256 paths, a T-3 link 2,048 paths and a 155M bit/sec Optical Carrier-3 link 4,096 paths. Verger said switch vendors must support these figures if carriers are to provide seamless service.

"This document gives our equipment vendors a specification to which they can build their network equipment," Hand said. "We can present the guidelines to the vendors as our requirements." ▣

Banyan prepping improved SNA connectivity in SCS

Expect increased sessions, more client support.

BY CHRISTINE BURNS

Westborough, Mass.

While the first users of Banyan Systems, Inc.'s SNA Communication Services (SCS) are applauding the product's ability to hook up VINES clients to IBM mainframes, Banyan is plotting to make SCS even better.

Banyan will roll out an enhanced version of SCS sometime in the first half of next year that works with Apple Computer, Inc. Macintosh, Microsoft Corp. Windows NT and Unix clients, adding to its existing DOS, Windows and OS/2 client support. The new version will also offer nearly double the number of concurrent mainframe sessions and, for OS/2 clients, feature tighter integration with the Presentation Manager interface.

Banyan's ties to SNA

	VINES Communication Gateway	SNA Communication Service (SCS)	Planned SCS enhancements
Clients supported	DOS, Windows and Macintosh	DOS, Windows and OS/2	Macintosh, Windows NT and Unix
Logical unit-types supported	1, 2, 3	0, 1, 2, 3, 6.2	Same
Maximum concurrent sessions	128	254	504
Link-types supported	SDLC and token ring	SDLC and token ring	X.25

Banyan offers SNA connectivity to IBM mainframes for both VINES and VINES for SCO clients through its VINES Communication Gateway and SNA Communication Service, respectively.

GRAPHIC BY TERRI MITCHELL SOURCE: BANYAN SYSTEMS, INC., WESTBOROUGH, MASS.

SCS, which began shipping last month, is based on SNA gateway technology from Digital Communications Associates, Inc. It runs on a VINES for SCO Unix server and provides 3270 emulation capabilities to personal computers running DOS, Windows and OS/2. SCS also includes support for Systems Network Architecture protocols and development tools, including Advanced Program-to-Program Communications, IBM's programming interface to SNA LU 6.2 sessions.

SCS is offered as an alternative to Banyan's VINES Communication Gateway product that provides SNA connectivity for native VINES clients via a dedicated workstation. SCS, however, runs on a VINES server and is therefore tightly integrated with other Banyan network services such as the StreetTalk directory services and security and management features.

"That tight integration has been invaluable to us as we've implemented this service throughout the company."

"That tight integration has been invaluable to us as we've implemented this service throughout the company," said Steve Bush, senior network engineer with Trellis/The Asset Group, a systems integration conglomerate based in Princeton, N.J. Bush has worked with a large Texas-based oil company to install SCS on Tricord Systems, Inc. servers running VINES for SCO at several sites across the country.

Bush said when SCS is installed it simply becomes a defined object in StreetTalk. Access, security and management of the service are filtered through the directory service. "What this boils down to for the end user is one click on an icon and then they've got a 3270 session without having to know where it came from," Bush said.

In addition to the new Macintosh, Windows NT and Unix client support, Walt Sizer, product line manager for connectivity at Banyan, said the company will also improve SCS support for OS/2 clients through tighter integration with its Presentation Manager graphical user interface.

"With the full support we are planning to add, a user can manipulate the session the way he wants by using the normal Presentation Manager tools and utilities, like drag and drop and direct cut and paste," Sizer said.

And while the current version of SCS only supports Synchronous Data Link Control and token-ring links to IBM mainframe systems, he said the new version will also support X.25 links.

OVER 500 SESSIONS

In addition to the better client and link support, Banyan will also raise the maximum number of concurrent logical unit sessions a SCS server can support from 254 to 504.

Thomas McDonald, principal of MGT Technology Group, Inc., a Framingham, Mass.-based consultancy, said users might shy away from the current version of SCS because of its limited session support.

"If you've got a system where you need to support more than that, Banyan is telling you that you've got to go out and buy another piece of hardware and another version of SCS just to get adequate access to a host," McDonald said.

Richard Scheafer, vice president of client/server technical services at Shawmut Bank in Hartford, Conn., beta-tested SCS last summer, but only used it on one server.

"The low number of LU sessions was definitely a problem for us because of the cost implications of buying multiple SCS packages," said Scheafer. "If Banyan were to to raise concurrent session threshold, I'd have to seriously think about using it on more servers because it is a good solid product for linking VINES clients to IBM mainframes."

©Banyan: (508) 898-1000.

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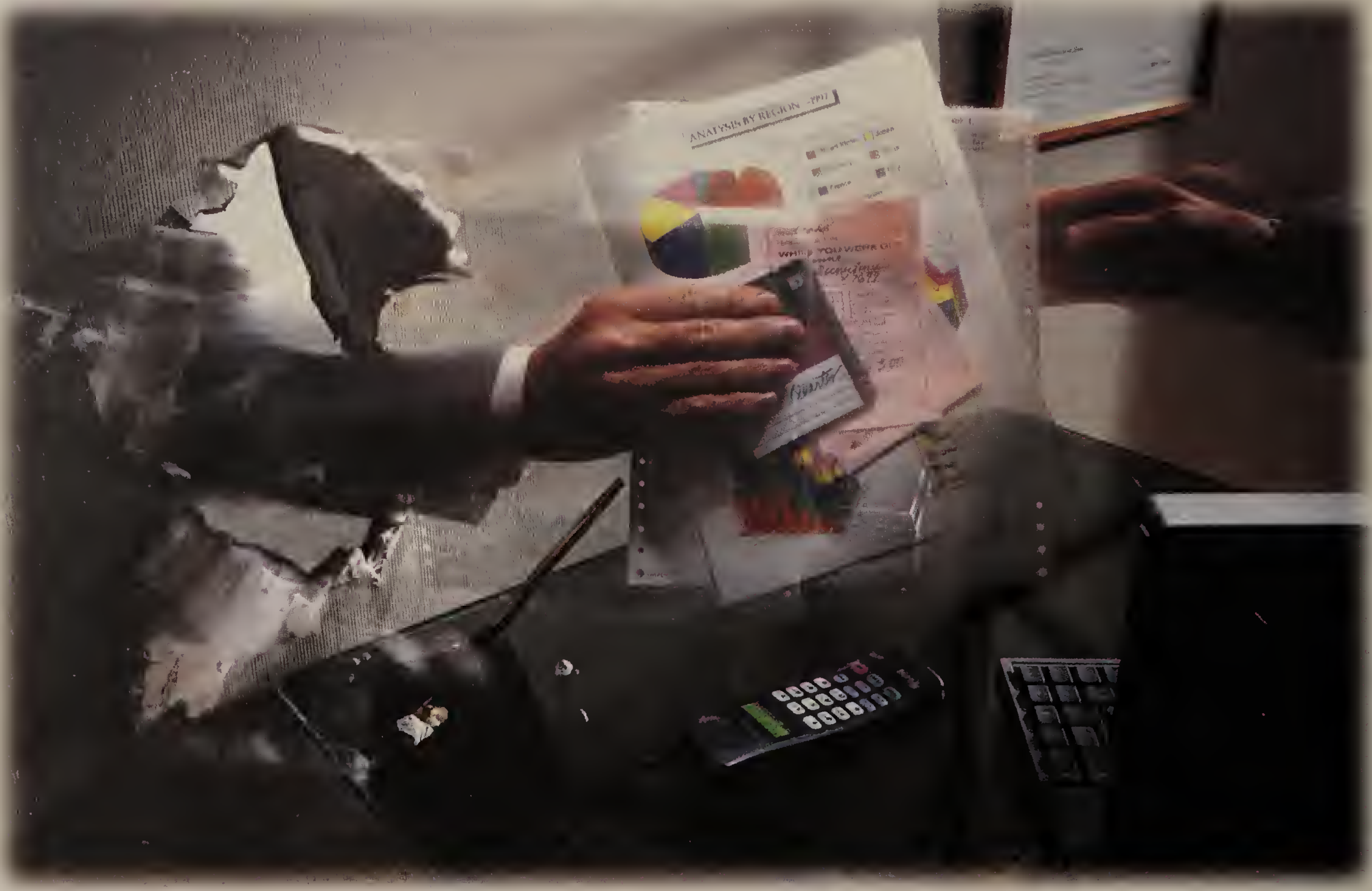

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ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

BRIEFS

Cisco Systems, Inc. last week announced an agreement under which **Ameritech** will distribute Cisco's full line of multiprotocol routers and internetworking servers in conjunction with Ameritech's wide- and local-area network integration and remote net management services.

Spar Communications Group last week unveiled a satellite transmission multiplexer — dubbed the Spar Data Line Multiplexer (DLM) — that supports up to 30 data channels operating at speeds of 38.4K bit/sec. The DLM features on-demand connectivity of individual circuits between two or more locations, letting users employ the capacity on an as-needed basis to conserve bandwidth. The device is designed to be used with Spar's family of satellite earth terminal systems, and complies with all CCITT and North American standards.

Spar: (619) 458-1800.

Hewlett-Packard Co. brought out a management application for its OpenView for Windows platform that lets users monitor and control personal computers on a Novell, Inc. NetWare local-area network. The application, called OpenView PC Client Manager, lets managers gather inventory and configuration information from NetWare clients, perform real-time monitoring of NetWare LANs, detect faults and isolate problems from a central OpenView for Windows console.

PC Client Manager costs $1,695 and will be available in November.

HP: (415) 857-1501.

Simpact Associates, Inc. has announced that users of its Freeway programmable gateway can now receive financial information from the Reuters MarketFeed 2000 network.

MarketFeed 2000 provides real-time information from more than 130 international exchanges on 16,000 exchange-traded instruments. Freeway can be programmed to support any combination of specialized and custom-developed wide-area network protocols. The gateway supports about 50 protocols for the financial services industry.

Simpact: (800) 746-7228.

DeskNet Systems, Inc. has unveiled a hand-held analyzer for Asynchronous Transfer Mode (ATM) nets. The DS3port "Dataman" analyzer combines DeskNet's DS3port analyzer and ATM Switch Analysis Package software. Dataman lets users test ATM virtual paths and virtual circuits comprised of T-3 pipes. The Dataman analyzer costs $6,990 and is available now.

DeskNet: (914) 273-6232.

NCR Corp. said users can now launch ProTools' local-area network management applications from NCR's StarSentry systems management platform. The ProTools/StarSentry integration lets net managers analyze and diagnose faults on distributed LANs from a StarSentry console. The ProTools applications support the Remote Monitoring Management Information Base.

ProTools management from a StarSentry platform will be available in second-quarter 1994.

NCR: (513) 445-5000.

IBM offers up a mix of WAN and LAN wares

Announces FEP enhancements, LAN hub.

BY MICHAEL COONEY

Raleigh, N.C.

Users looking to build more efficient enterprise nets got some help from Big Blue last week as the company rolled out a slew of new local- and wide-area network products.

The products, which were expected, included additional communication-line support for the venerable IBM 3745 front-end processor (FEP), new versions of the FEP's Network Control Program (NCP) operating system software, a new low-end 8250 LAN hub/server and a new remote office 9733 IDNX multiplexer (*NW*, Sept. 20, page 1).

"We are trying to make it easier for users to consolidate their existing networks and make it easier to accommodate multivendor environments," said Miriam Green, manager of NCP development for IBM.

For the FEP, IBM rolled out a new Synchronous Data Link Control line adapter for the 3746 Model 900. The 3746 is a hardware extension that works with existing 3745 Models 210, 310, 410 and 610 to expand capacity and off-load data communications processing normally done by the main 3745 CPU.

The new SDLC adapter can support as many as 100 64K, 19.2K and 9.6K bit/sec lines, up to 32 256K bit/sec or 4 T-1 lines, or any combination. This represents almost an eightfold increase over existing 3745 SDLC adapters. A 3746 can support up to 10 SDLC adapters, or a combination of SDLC adapters and Token-Ring or Ethernet adapters.

The new SDLC adapter also offers a 1 1/2- to threefold throughput improvement, Green said.

IBM also reiterated that it will add support for frame relay Data Terminal Equipment and Data Communication Equipment (DTE/DCE) services to the 3746 expansion chassis in the next year.

The current 3745 supports frame relay DTE/DCE services, but adding the same support to the 3746 with its off-loading capabilities will improve Systems Network Architecture/frame relay throughput threefold, the company said.

TWO NEW NCPs

IBM also announced two new versions of the FEP's NCP operating system. NCP Version 6 Release 3 will support the new SDLC adapter. NCP Version 7 Release 1 adds support for Transmission Control Protocol/Internet Protocol routing via the Routing Information Protocol (RIP), which will let it

See IBM, *page 12*

IBM's fall networking lineup

Product	Availability	Price
8250 Model 6PS hub	Dec. 31	$7,000
6-port Ethernet Bridge	Nov. 19	$2,675
Ethernet Switch	Dec. 17	$2,030
Workstation Networking Module	Jan. 28	$12,990
Hub Management Program/DOS Entry Version 1	Jan. 28	$995
AnyNet/2 Sockets Gateway	Dec. 31	$1,950
3746 SDLC adapter	Jan. 28	$20,000
High-speed adapter	Dec. 31	$5,500
Low-speed adapter	Dec. 31	$5,500
Network Control Program (NCP) 6.3	Jan. 28	$396-$1,976 per month
NCP 7.1	Jan. 28	$396-$1,976 per month

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: IBM, RALEIGH, N.C

ROUTER/HUBS

Cray enters boundary router market

BY MAUREEN MOLLOY

Annapolis Junction, Md.

Cray Communications, Inc. this week will become the latest in a long line of vendors to invade the lucrative low-end router market.

Scott Rey, Cray's director of marketing, said his company's new router line will address critical user requirements for remote branch office routers, including simplicity, centralized network management and, perhaps most importantly, low price.

Cray's new router line includes two versions: the Ethernet BR6100, a three-port device that supports a single Ethernet and two wide-area network ports; and the Ethernet-Token Ring BR6500, a four-port model that supports one Ethernet, one token ring and two WAN interfaces.

Both support the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX) and Digital Equipment Corp.'s Local Area Transport, as well as Open Systems Interconnection protocols. On the wide-area side, the routers support X.25, frame relay and the Point-to-Point Protocol at speeds up to T-1.

Cray said the new products will compete directly with Cisco Systems, Inc.'s Cisco 2000 and 3Com Corp.'s NETBuilder Remote Control router — better known as the Boundary Router (see graphic, page 12).

See Cray, *page 12*

Motorola Codex unveils SoftCell switch

BY JIM DUFFY

Mansfield, Mass.

Motorola Codex last week officially unveiled its 6950 SoftCell ATM Networking Node, a switch differentiated from the competition by its ability to guarantee quality of transmission service for different types of traffic.

SoftCell has a 1G bit/sec cell bus but can also function as a 500M bit/sec circuit switch. It's designed to anchor private backbone nets and provide public carrier services (*NW*, Oct. 4, page 1).

The switch sports 17 slots and as many as 1,000 ports, supporting subrate, Nx64K bit/sec, T-1, E-1, frame relay and Asynchronous Transfer Mode (ATM) interfaces. Internodal trunks top out at T-1, but T-3 links are planned for the second half of 1994.

In addition to standard 53-byte ATM cell sizes, SoftCell includes a variable-length cell assembly feature for more efficient transmission of traffic at T-1 speeds and below. The switch is also software-configurable, meaning a user can reconfigure a port from a central network management station without swapping out hardware modules.

It is this software-configurability upon which SoftCell's class-of-service capability, called Portfolio Quality of Service (QOS), is built. QOS guarantees network availability for different types of traffic, such as Systems Network Architecture, voice and local-area network data, Motorola Codex said.

QOS links call routing, queuing and congestion control into a unified set of services that a user can configure for particular applications.

"For any entity coming into the switch, you can configure what the delay needs to be end to end," said Gail Smith, director of worldwide product marketing for Motorola Codex. For each application, users can specify transmission throughput and whether it will tolerate any cell loss or less reliable circuits, she said. Competitive offerings can only guarantee throughput, the company claimed, although StrataCom, Inc. is expected to unveil a class-of-service scheme for its Broadband IPX switch that is similar to Motorola Codex's.

QOS parameters will be maintained even in the event of circuit failures and rerouting, Smith said.

SoftCell has seven separate buffer queues for different types of traffic. The switch can dynamically allocate additional bandwidth to lower priority traf-

See Motorola, *page 12*

MULTIVENDOR NETWORKING

Network Systems off-loads TCP/IP

BY MICHAEL COONEY

Minneapolis

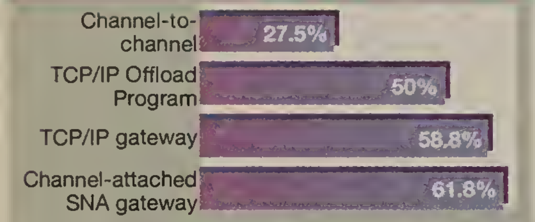
Network Systems Corp. has joined the drive to move TCP/IP processing off the mainframe and onto more economical boxes.

The firm has unveiled TCPexcel, a software and hardware combination that acts as a local-area network-to-mainframe gateway and off-loads Transmission Control Protocol/Internet Protocol processing from the mainframe. Like IBM's 3172 Interconnect Controller TCP/IP Offload Program, TCPexcel gives users new network configuration options, but supports more users and higher speeds.

"This is a faster, more flexible alternative to the off-load technology found in IBM's 3172 Offload product," said Kevin Collins, product marketing manager at Network Systems.

Collins said TCPexcel will cut TCP/IP processing on the mainframe by 90% and increase TCP/IP performance by 200%. IBM, with its 3172 TCP/IP off-load technology, promises a 30% reduction in mainframe TCP/IP processing cycles.

How will you use an interconnect controller?



Study based on responses from users at 102 of the largest 1,000 U.S. companies. Multiple responses were permitted.

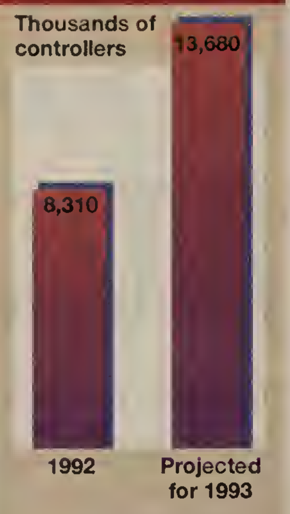
SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY TERRI MITCHELL

TCPexcel comprises application software and a Reduced Instruction Set Computing-based coprocessor board, which reside on the company's Data eXchange Extended (DXE) LAN-to-mainframe gateway, plus a mainframe application program interface to the MVS TCP/IP program.

The TCPexcel application is offered on three DXE models. The low-end DXE 7272 Model 416 supports a connection to one 4.5M byte/sec IBM mainframe channel and two slots, which can be configured for the TCPexcel coprocessor board or a Token-Ring, Ethernet, Fiber Distributed Data Interface LAN board.

The six-slot box contains 2M bytes of main memory and 4M bit/sec of total capacity. The Model 516 is a twin of the 416, but it comes with completely redundant coprocessor interfaces and power supplies.

Interconnect controller installed base



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

The DXE Model 726 offers 13 slots, which can be configured to support a maximum of three mainframe channels and any combination of up to seven Token-Ring, Ethernet or FDDI links. The Model 726 comes with 4M bytes of memory and a total capacity of up to 800M bit/sec.

With all of the DXE models, users have the option of supporting a frame relay, Asynchronous Transfer Mode or Switched Multimegabit Data Service wide-area link to a remote LAN. The DXE supports the Routing Information Protocol TCP/IP routing protocol for sending TCP/IP data across wide-area connections.

As a competitor to IBM's TCP/IP Offload Program, TCPexcel supports mainframe channel connections with as many as three mainframes. IBM's 3172 can support two channel connections to one mainframe, but the same box cannot link to different mainframes. IBM's 3172 also has no wide-area support when used in TCP/IP Offload mode.

"The off-load technology saves expensive mainframe cycles, but it also facilitates high-speed TCP/IP file transfers and applications like data storage and fast LAN backup applications," Collins said.

The key to TCPexcel's performance is the use of parallel processing in the DXE hardware, Collins said. Competitive products have a single-processor controlling channel, media and protocol processing, he said. "We use separate processors for each task."

TCPexcel is available now for prices ranging from $11,500 to $50,000, depending on configuration.

©Network Systems: (612) 424-4888.

Motorola

Continued from page 11

fic when the queues for high-priority traffic are empty.

Motorola Codex's QOS technique complies with the ATM quality-of-service standard but goes beyond the standard in that it allows users to fine-tune QOS through software, analysts said.

"If you can set up quality-of-service parameters within each standard class of service, then you're offering something over and above the generic ATM approach," said Rick Malone, principal of Vertical Systems Group, a Dedham, Mass., consultancy.

Most competitive offerings do not provide quality-of-service parameters beyond the ATM standard, Malone said.

Joe Noel, Dataquest, Inc.'s principal analyst, said he believes SoftCell's proprietary QOS capability will have a particular appeal to IBM shops that are integrating SNA and LAN traffic.

"I look at the integration of SNA traffic into the multiprotocol backbone as really the pot of gold at the end of the rainbow," Noel said.

"Whoever can do that best is going to make a lot of money. Motorola Codex is saying, 'We have to pay particular attention to that,' " he added.

Electronic Data Systems Corp., Infonet Services Corp., Novell, Inc. and WilTel will beta-test SoftCell in the first quarter of 1994. The switch will be commercially available in the second quarter of 1994.

SoftCell ranges in price from $60,00 to $200,000.

©Motorola Codex: (508) 261-4000.

IBM

Continued from page 11

act as an IP router, and gives the FEP support for TCP/IP and RIP over the 3746's Token-Ring coupler.

Also in NCP 7.1 will be support for Advanced Peer-to-Peer Networking (APPN) border node connections, which lets users link multiple APPN nets, similar to how today's SNA nets can be connected via IBM's Systems Network Interconnect feature.

IBM also announced the AnyNet/2 Sockets over SNA Gateway, OS/2-based software that lets TCP/IP Sockets applications on an SNA net communicate with Sockets applications on a TCP/IP net without changing either application.

AnyNet is IBM technology that makes applications independent of their underlying communications protocols.

IBM said the gateway will serve a variety of functions, such as connecting remote TCP/IP nets with an SNA backbone. It will also let applications typically associated with TCP/IP, such as File Transfer Protocol, interact with similar applications on SNA nets.

IBM also for the first time said it will be developing an AIX version of AnyNet to run on the RISC System/6000. That will probably be available late next year.

HUB/SERVER COMBO

On the hub front, IBM announced the 8250 Model 6PS, an integrated hub/server designed for remote offices. The Model 6PS combines the functionality of the 8250 with a Personal System/2 server to offer six slots for standard 8250 Token-Ring, Ethernet and Fiber Distributed Data Interface modules, plus five 16-bit PS/2 adapters to support Token-Ring, Ethernet, SDLC or other PS/2 boards.

With the new box, users can connect LANs attached to the OS/2 LAN Server-based PS/2 with other LAN segments attached to the hub.

"Basically, we are creating a LAN-in-a-can environment," said Bob Roth, manager of network access systems marketing for IBM. "It will let small organizations link multiple small LANs or groups of users through one box."

MODULE MANIA

IBM also introduced several new modules for the hub. The Workstation Networking Module provides IBM 3174 Establishment Controller functions, enabling users to attach 3270 devices directly to the hub without requiring a separate 3174 Communications Controller.

New six-port Ethernet Bridge and Switch modules will let users more efficiently attach Ethernet LAN segments to the hub. The six-port bridge module lets users attach as many as six Ethernet LAN segments into a single port on the hub, up from two hubs currently. The switch will provide high-performance switching between Ethernet segments linked to the hub.

"This is only the beginning of the features IBM is going to add that will make the hub a more important player in enterprise environments," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C.-based consultancy.

IBM is still expected to announce by the end of the year a larger hub for its 8250 family that is expected to have double the capacity of its largest existing 8250 (*NW*, Oct. 4, page 1).

©IBM: (914) 642-6238.

Fighting it out at the low end

How Cray Communications' BR6000 Series router stacks up against 3Com Corp.'s NETBuilder Remote Control router and Cisco Systems, Inc.'s Cisco 2000 router.

Product	Cray's BR6000	Cisco's 2000	3Com's NETBuilder Remote Control
LAN/WAN ports	1 or 2 LANs, 2 serial ports up to 1.5M bit/sec; X.25, frame relay	1 LAN, 1 serial port up to 1.5M bit/sec; X.25, frame relay	1 LAN, 1 serial port up to 7M bit/sec; X.25, frame relay
Protocols supported	TCP/IP, IPX, DEC Local Area Transport, OSI, bridging	TCP/IP, IPX, AppleTalk, bridging	TCP/IP, IPX, AppleTalk, XNS, DECnet, OSI, VINES, bridging
Automatic configuration	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes
Bandwidth-on-demand	Yes	Yes	Yes
Price	$3,495-$4,795	$3,195	$3,495

GRAPHIC BY SUSAN J. CHAMPENY

Cray

Continued from page 11

Both versions include a port that lets remote users dial in to the router and access the corporate internet via the router's wide-area link, reducing long-distance charges.

In addition, the routers are outfitted with software that enables them to sense when a primary link has failed and automatically establish a dial-up connection for backup.

PLUG AND PLAY

In an effort to keep router deployment and management simple, the routers are also equipped with a plug-and-play feature that will enable net administrators to download configuration information from a central site, all but eliminating the need for technical expertise at small branches.

The BR6100 costs $3,495, while the BR6500 costs $4,795. Both will be available in January.

Cray will also announce this week the U.S. launch of its System Center intelligent hub that includes integrated terminal server, gateway and routing functions.

The System Center chassis is available in two-, five-, 14- and 17-slot versions, and supports an aggregate capacity of 1G bit/sec. The hub backplane consists of three Ethernet buses, a 200M bit/sec dual-Fiber Distributed Data Interface bus, three 250M bit/sec High Speed Inter-Module Buses and a 64M bit/sec management bus.

It supports a spate of different modules, including concentrators for Ethernet, token-ring and FDDI local-area networks, local and remote bridge/routers, as well as terminal servers with gateway options for asynchronous, twinaxial and coaxial terminals.

The System Center hub is available now with a starting price of $27,500.

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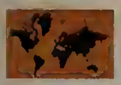

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Circle Reader Service #7

by Scott Bradner

Branching out with the Internet

Last month, I wrote about the apparently sudden popularity of the Internet, at least among the press corps. Well, the recognition of the Internet is big and getting bigger. The Internet made the front page of last week's Sunday *New York Times* "Week in Review" section, and I just saw an advertisement on a local Boston TV station (WCVB) telling viewers how to send E-mail to the station. (They called it the "Internet system" as if it were a computer, but it's the thought and connectivity that counts.)

Perhaps in spite of this attention, the actual number of connections to the Internet continues to grow at a rate that would be the envy of any marketing organization. In addition, many more organizations and individuals are getting their feet wet in the Internet business by obtaining accounts on the growing number of systems that offer Internet access. For example, WCVB uses America on Line for its access, and this newspaper uses Software Tool & Die in Boston.

With all of this growth, however, there is one type of connection that is almost entirely absent: The Internet is not seen as a way to connect branches of an organization together.

Many companies have their own PBXs but buy standard long-distance service from one of the carriers rather than lease point-to-point lines between PBXs in different branches. Yet these same companies use leased lines to link LANs in the same branches.

Why should they roll their own, since in most cases connecting each branch to the Internet and communicating through it would yield a less expensive and often higher speed connection? There seem to be two basic reasons: The Internet is not seen as secure enough or reliable enough for intracompany use.

The thought that packets containing company secrets or user lognames and passwords could wander throughout a shared infrastructure where they might be monitored can, and should, make a corporate data security person feel a bit queasy.

But it is easier to tap a dedicated data link than to separate the traffic for a particular site from a shared backbone.

But there is more than a germ of reality to the concern. Any connection to a shared data service does open opportunities for those who might wish to violate the sanctity of the corporate LAN. While it should be noted that most cases of this type of violation are made by users with legitimate access to the local network, the issue of security is one that providers of Internet service must address a bit better than they generally have in the past.

The issue of reliability seems to be one more of understanding and careful shopping than reality. Almost all Internet service providers have mesh networks with redundant connections for reliability. The TCP/IP routing protocols in use in these networks will automatically reroute around failed links. That leaves only two single points of failure for most providers: the link to the customer and the link to the rest of the Internet.

Experience has shown that line failure is much more common than equipment failure. Since a user would likely use the same carrier, whether they go the leased line or Internet route, it is unlikely the repair time for the failed link would be different in either case.

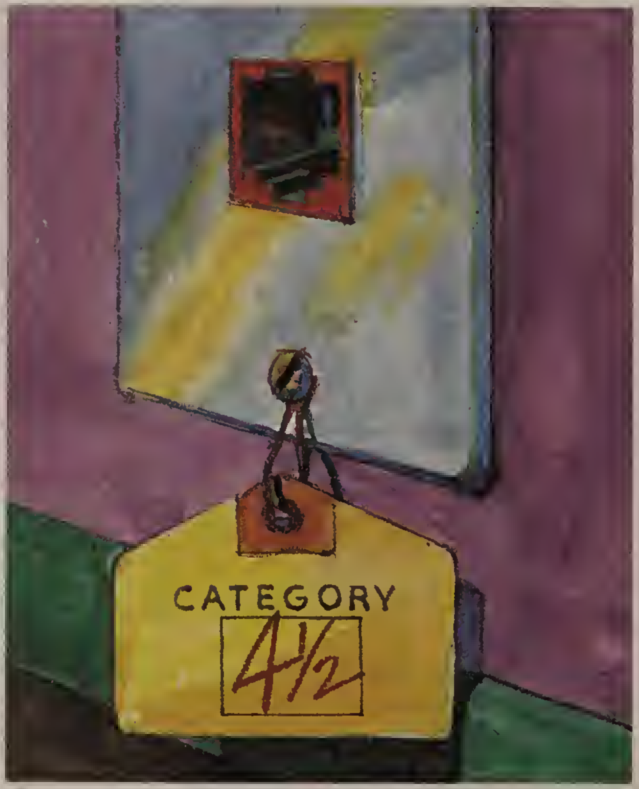
It is also true that some Internet providers have a better response record, so any prospective customer should ask for references.

There are a number of other reasons that can be mentioned as to why a company would build their own network. One common reason is that the Internet does not provide for the transport of the protocols, which are becoming prevalent in the corporate network and, of course there is the ever-present, "Mother please, I'd rather do it myself."

With the advent of more systems that support TCP/IP and a better understanding of the reliability issue, security is left as the main roadblock to the logical way of connecting branch offices together. Hopefully, the service providers will begin to address this issue in a way that companies find believable.

➻ Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Is Your LAN Cable System Really Category 5?



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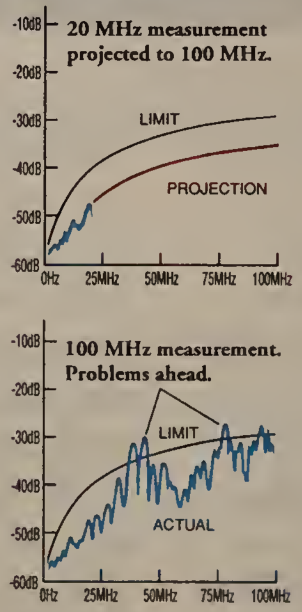

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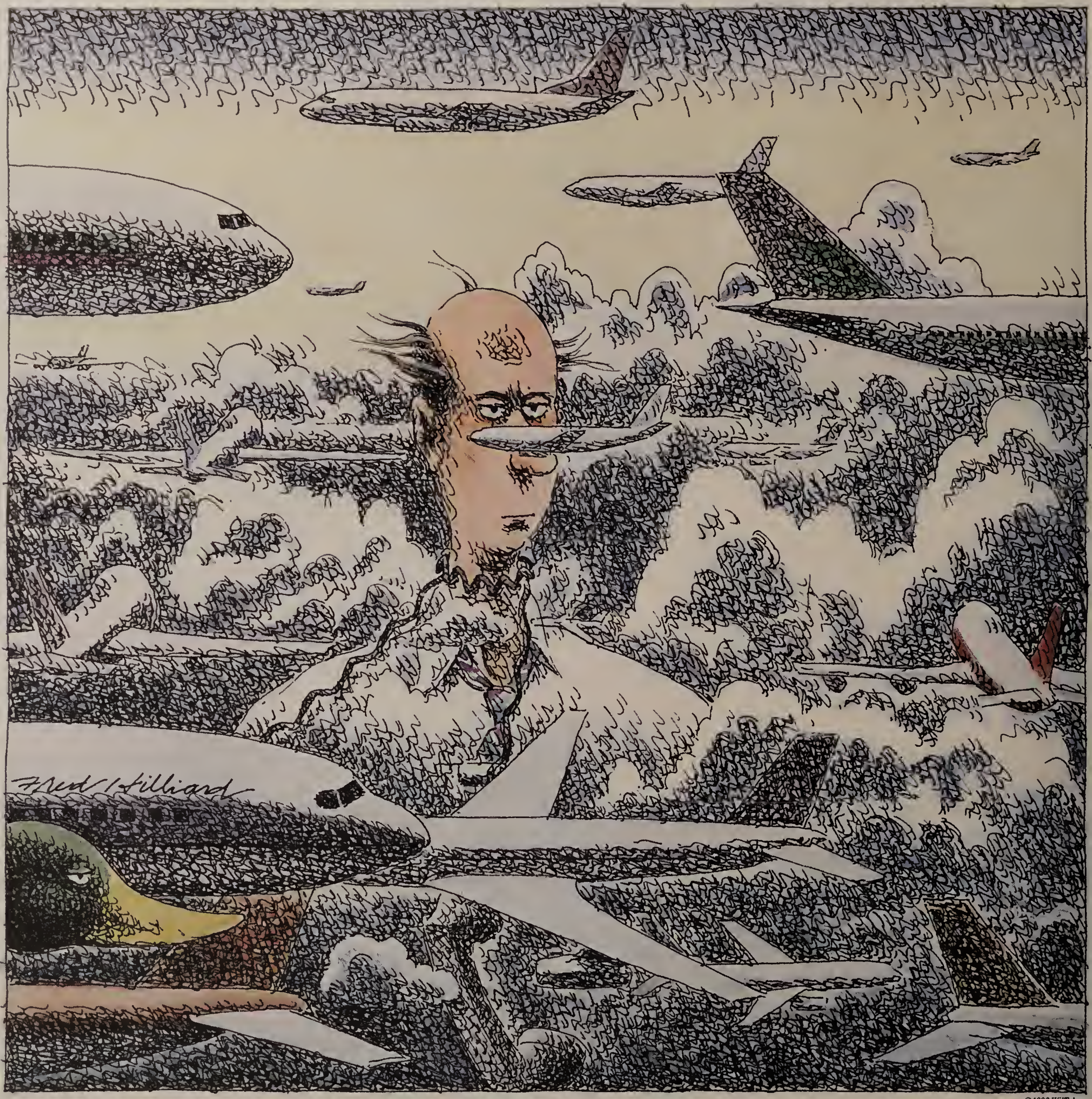

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BRIEFS

Mountain View, Calif.-based **Token Technology, Inc.** rolled out its RemoteVision MultiPort Server software that provides local-area network-to-personal computer or LAN-to-LAN connectivity for remote LANs with as many as 64 end nodes. The bridging software resides on a nondedicated LAN-attached server and communicates with remote node software modules residing on remote PCs. The remote node software performs LAN adapter emulation, allowing the remote PC to appear logically as part of the corporate LAN.

The software supports DOS, Windows and OS/2 clients in Novell, Inc. NetWare, IBM LAN Server and Microsoft Corp. LAN Manager environments. The product is available now, with prices ranging from $695 to $16,495.

Token Technology: (415) 965-8607.

The next **Greater Boston Area Novell Users Group** monthly meeting will be held Nov. 9 at Proteon, Inc. in Westborough, Mass., starting at 6:30 p.m. The group's annual meeting will take place Dec. 14 at the Marriott Hotel in Burlington, Mass.

Steve Isenberg, group vice president: (508) 794-9803.

Pilkington Communications, Inc., a hub maker based in White Plains, N.Y., has unveiled a stackable Ethernet hub with eight fiber-optic ports and two unshielded twisted-pair ports. The MaxiHub 5032 also offers two plug-in daughterboard slots. One can be used for a Simple Network Management Protocol module, while the other supports an additional port that can be configured as a fiber-optic, thick or thin coaxial cable, or an attachment unit interface connection.

As many as three 5032s can be stacked together and managed as a single logical repeater supporting 32 users.

Available now, the 5032 costs $3,092 and the SNMP module costs $704. Additional port modules cost from $120 to $349.

Pilkington: (914) 683-3732.

Luxcom, Inc. of Fremont, Calif., last week announced a new version of its Network Management Station (NMS) software that will include token-ring beacon protection capabilities. NMS Release 1.4, which is used to manage the company's Series 2000 Multiplexing Hub, will identify and isolate a beaconing port in less than 30 seconds.

NMS 1.4 is available now and costs $2,995.

Luxcom: (510) 770-3300.

Xyplex, Inc. has rolled out a 12-port module, called the 301 Port Switching Token Ring interface, for its Network 9000 Routing Hub. The hub has two token-ring buses that run at 4M and 16M bit/sec, respectively. The 301 can detect which speed end nodes are running at and automatically link the nodes to the correct token ring. Available now, the 301 Port Switching Token Ring interface costs $1,995.

Xyplex: (508) 264-9900.

Competition heats up in peer market

Novell's new offering lets users more easily connect to NetWare.

BY CARYN GILLOOLY

San Jose, Calif.

After having discussed its plans for more than six months, Novell, Inc. last week brought out the next generation of its peer-to-peer networking product, now called Personal NetWare.

Unlike its predecessor, NetWare Lite, Personal NetWare will not only provide peer-to-peer networking capabilities, but will also let users access NetWare 2.X, 3.X and 4.X servers without additional client software.

The new product also includes a Simple Network Management Protocol agent and will be manageable under Novell's NetWare Distributed Management Services (NDMS) umbrella unveiled earlier this month (*NW*, Oct. 4, page 1).

Personal NetWare, like NetWare Lite, is a peer-to-peer network operating system designed for users with generally lower end networking needs. Personal NetWare lets users in small work groups of as many as 50 users share printers and other peripherals while also sharing files between individual DOS- and Windows-based workstations.

"Personal NetWare uses a lot of the key features of NetWare Lite, such as single logon and the ability to assign access rights to resources as opposed to individual users," said a spokesman from Novell's Personal Systems Group, based here.

But NetWare Lite does not provide tight integration with NetWare, as does Personal NetWare, he added.

Ken Diliberto, network systems specialist for the city of Fresno, Calif., and a beta user of Personal NetWare, said the new software will integrate easily with NetWare.

See Novell, *page 22*

Peer pressure

Comparison of Artisoft, Inc.'s Simply LANtastic, Novell, Inc.'s Personal NetWare and Performance Technology, Inc.'s POWERLan for Windows 3.0.

Company	Artisoft's Simply LANtastic	Novell's Personal NetWare	Performance Technology's POWERLan for Windows 3.0
Price per node	$79 software-only; $149 hardware/software	$99 software-only; NA	$99 software-only; $225 hardware/software
Target number of nodes supported	2-10	2-50	2-225
Operating systems support	DOS, Windows	DOS, Windows	DOS, Windows
E-mail support	LANtastic E-Mail	Any MHS-based package	Lotus Development Corp.'s cc:Mail
Ties to other network operating systems	LANtastic 5.0*	NetWare	Performance Technology's POWERserve
Adapter support	Ethernet, Network Driver Interface Specification-compatible adapters	Adapter-independent	Adapter-independent
Availability	December	December	November

* Simply LANtastic users can gain access to NetWare through a LANtastic 5.0 connection.
NA = Not applicable

Artisoft, Novell and Performance Technology are all releasing new peer-to-peer networking products. Listed above are the feature sets of each.

GRAPHIC BY TERRI MITCHELL

SOURCE: *NETWORK WORLD*

Artisoft and Performance Technology target low-end users.

BY CHRISTINE BURNS

Artisoft, Inc. and Performance Technology, Inc. have set their respective sights on the entry-level peer-to-peer network market with products that walk novice networkers through installation and use.

Artisoft has announced Simply LANtastic, a scaled-down version of its LANtastic 5.0 software that offers a menu-driven interface letting users easily control simple file, print and CDROM sharing services. And Performance Technology this week will unveil POWERLan for Windows 3.0, its first product to include a Windows interface.

"By 1996, we expect that 70% of the networks installed are going to connect less than 35 users," said Joseph Waldego, director of marketing at Artisoft in Tucson, Ariz. Since Artisoft already owns a large piece of the 10 to 35 node peer market with LANtastic, Simply LANtastic is targeted at two to 10 personal computer users.

Simply LANtastic users can share printers, files, hard disks and CDROM drives, and communicate via electronic mail. The distinguishing feature of Simply LANtastic is its menu-driven interface that lets a user print jobs, use E-mail, and define which disk drives and printers peers can access.

Simply LANtastic users sacrifice the higher level of security found in LANtastic 5.0. While LANtastic 5.0 users define exactly which files their peers have access to, Simply LANtastic users can grant only full, read-only or no access to certain directories.

Simply LANtastic nodes have to be outfitted with Ethernet boards and are linked in a daisy-chain fashion using thin coaxial cable. They can also be connected to LANtastic 5.0

See Artisoft, *page 22*

MERGERS

Ethernet switch vendor Artel merges with Chipcom

BY SKIP MACASKILL

Southborough, Mass.

And the beat goes on.

The acquisition and merger trend in the hub market gained steam last week when Chipcom Corp. signed an agreement to merge with Ethernet switch vendor Artel Communications Corp.

Under terms of the $47 million agreement, Chipcom will issue about 674,000 shares of its stock in exchange for all of Artel's outstanding shares. The vendors expect the transaction to close by February.

The move comes on the heels of similar deals announced recently, including Cisco Systems, Inc.'s buyout of Crescendo Communications, Inc., Network Systems Corp.'s acquisition of Bytex Corp. and SynOptics Communications, Inc.'s takeover of Coral Network Corp.

According to Rob Held, president and chief executive officer at Chipcom, the merger will provide his company with not only a complementary technology to its configuration switching — which allows each port in a hub to be logically assigned to any local-area network supported by the hub — but also a new product line.

Artel's flagship product is the Galactica Ethernet switching hub, which can support as many as 32 10M bit/sec dedicated Ethernet links. Chipcom will resell that device as a stand-alone product and incorporate its

See Merger, *page 21*

Chipcom, Artel merge

Chipcom Corp.

Founded: 1983

Located: Southborough, Mass.

Employees: 517

Estimated 1993 revenue: $140 million

Artel Communications Corp.

Founded: 1981

Located: Hudson, Mass.

Employees: 63

Estimated 1993 revenue: $10 million

The merger

Chipcom to swap 674,000 shares of its common stock in exchange for all outstanding Artel shares.

Estimated value of deal: $47 million

Completion expected: February 1994

SOURCE: *NETWORK WORLD*

TRAPPED IN THE BODY OF THIS TINY SE

This is a story about a small computer engineered to be so dependable, you won't think twice about trusting it with your mission-critical applications. And to be this without filling a closet, much less a room. If you haven't thought of Compaq as an enterprise-critical platform before, we invite you to grab your bifocals and begin. (We'll be cramming a lot of information into this ad, which, given how much we managed to fit into our new servers, only makes sense.)

If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which makes the introduction of the new Compaq ProLiant Server even more timely.

The ProLiant is a new family of affordable, high-performance, easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

Now, how can you be sure our server is truly a miracle and not a mirage? To begin with, there's Full Spectrum Fault Management, provided by Compaq Insight Manager technology and software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.

If the performance of a monitored component drops below a specified level, our unique Pre-Failure Warranty kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No downtime. Ringing cash registers. Happy boss.*

Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

VER IS A MAINFRAME WITH AN ATTITUDE.

For example, Automatic Server Recovery 2 uses a historical record of server status and performance to perform an astonishing array of tasks. Like intelligently restarting the server, automatically correcting a variety of problems, and accessing a telephone pager to contact network administrators.

By now you'd expect us to have rethought server setup, configuration and OS installation, but you might be surprised by the results. Introducing SmartStart, a CD-ROM system that takes the headache out of getting your server up and running. ProLiant includes a CD-ROM drive and bundled CDs of optimized Netware and other major operating systems. To get hooked up to your network operating system, simply call your dealer for an access code, enter it, answer a few questions, and leave. Minutes later—say, after you've enjoyed a cup of coffee and a jelly donut—you'll return to find an integrated OS fully installed and optimized for increased performance and improved management. And we'll keep you updated via CD when new operating system versions appear.

And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade** direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site† warranty, and 7-day-a-week, 24-hour-a-day technical support.

All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about $6000‡.

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. For more information on the new Compaq ProLiant servers, or for the location of an authorized Compaq reseller near you, just call us at 1-800-345-1518. If you'd like to receive model, feature and specification information immediately via fax, select the PaqFax option. Or, if you'd like that information even sooner, just turn the page.

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THE NEW COMPAQ PROLIANT MISSION-CRITICAL SERVERS

	ProLiant 1000	ProLiant 2000	ProLiant 4000
HIGH PERFORMANCE NETWORK SERVERS			
Processor	Intel 486DX2/66 or Pentium 60MHz	Intel 486DX/50 or Pentium 66MHz	Intel 486DX/50 or Pentium 66MHz
Architecture	TriFlex/PC One Processor	TriFlex with up to two symmetric processors	TriFlex with up to four symmetric processors
Network Interface	Up to 12 High-Speed Channels; NetFlex 2 with Packet Blaster Technology Standard		
Standard Disk Controller	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
Estimated Starting Street Price‡	$6,000	$8,900	$13,900
SERVER DEPENDABILITY AND AVAILABILITY			
Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance		
Fault Prevention	Insight Manager alerts you to server status changes in over 800 component parameters, allowing proactive server management backed by 3-Year Pre-Failure Warranty		
Fault Tolerance	Standard support for RAID levels 1,4,5; hot-pluggable drives; on-line spare drive; off-line backup processor§; advanced ECC RAM§		
Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
SIMPLICITY, EASE OF OWNERSHIP AND SUPPORT			
SmartStart	Standard CD-based intelligent hardware configuration and system software installation, providing simplified server configuration for NetWare, NT or Unix. (CD-ROM drive standard)		
System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
4-Hour Warranty Response Upgrade	Optional Three-Year On-Site Warranty upgrade to 4-hour response		
Technical Support	Toll-free, 7 x 24 technical phone support from Compaq engineers		
CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
QuickFind/PaqFax	Proactive notification and delivery of new technical information/7 x 24 fax response for updated specification, configuration and settings data		

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Central Point to enhance its data integrity, antivirus offerings

BY SKIP MACASKILL

Beaverton, Ore.

Central Point Software, Inc. this week will roll out a new version of its Novell, Inc. NetWare virus protection software, as well as its first OS/2-based version and enhancements to its data integrity products.

Central Point Software, Inc. has a worldwide customer base of over 5 million users, with products available in more than 30 countries and 6 foreign languages.

Central is releasing Version 2.0 of Central Point Anti-Virus (CPAV) for NetWare, software that defends files residing on Novell, Inc. NetWare 3.X and 4.X servers from known and unknown viruses.

Running as a NetWare Loadable Module on the server, the software adds several new features: installation of client/server antivirus software from a central location; support for Novell's NetWare Management System via the Simple Network Management Protocol; and automatic updating of virus signatures on devices across the network.

Version 2.0 of CPAV for NetWare will be available at the end of next month. It costs $1,199.

Central also announced a new version of CPVA for 32-bit OS/2 systems. In addition to the NetWare version of CPVA, the firm also offers software for DOS, Windows and Apple Computer, Inc. Macintosh computers.

CPAV for OS/2 offers all the virus detection features of Central's other CPAV products. Available now, it costs $129.

In addition to the antivirus product upgrades, Central will offer enhancements for both its DOS and Windows data integrity products.

Version 9.0 of PC Tools Pro for DOS features a new work recovery utility, dubbed CPR, that automatically backs up system and video random-access memory to an image file on a hard disk at user-defined intervals. This allows unsaved work in progress to be restored after a network crash.

Available now, PC Tools Pro for DOS 9.0 costs $180.

To help Macintosh users, the company will introduce Version 3.0 of its MacTools data integrity software. One of its new features is TrashBack, which allows a deleted file to be restored to its original folder with a single mouse click.

The software also features AutoCheck, a background application that periodically scans local hard disks and sends an alert screen to the user if the data on the disk has been corrupted.

MacTools 3.0 is available now for $150.

©Central: (503) 690-8088.

Ethernet

Continued from page 17

technology into a next-generation hub planned for the first quarter of next year.

"There is a demand right now for standalone switching products," Held said. "This merger allows us to offer Artel's Galactica switching hub to meet that [need] as well as leverage that technology to complement our configuration switching features and cell switching technology" obtained by Chipcom under an agreement with IBM.

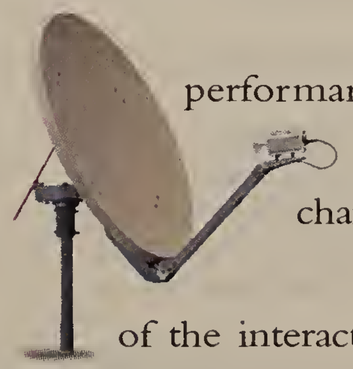
Ethernet switching that provides dedicated 10M bit/sec links to the desktop is the next logical step after configuration switching, according to Held. Switched Ethernet will play well with Asynchronous Transfer Mode, another switch-based technology, he added.

The merger provides Artel with answers to the two biggest issues facing its users.

"Our customers were concerned about future product evolution and whether we had the resources to support them over time," said Richard Santagati, president and chief executive officer at Artel. "A marriage with Chipcom answers those issues immediately and completely."

Analysts were generally supportive of the merger. According to Todd Dagres, vice president of data communications at The Yankee Group, a Boston-based consultancy, Chipcom acquired the technology it needs to compete at the high-end of the hub market.

"Chipcom got the high-performance platform it needed to provide an integrated switching solution in its next-generation product," he said. "The issue of where the routing will come from, however, is still on the table. The most likely source for Chipcom in that area would be IBM, but the 6611 is not a strong routing platform for LAN applications."


Unlock your LAN's full potential with VSATs from Hughes.

If you still think landlines are the best way to link up to your LANs, then you haven't talked to Hughes Network Systems. Today, top organizations around the world have turned to Hughes, the leader in VSAT satellite communications, to provide an affordable, high-quality source of LAN interconnection for their business networks. They've found that a Hughes VSAT can offer high performance and LAN capability, with added flexibility for system changes and expansions. And only Hughes, provider of over 70% of the interactive VSAT installations in the U.S., offers service for both Ethernet and Token Ring configurations. Why be LANlocked when you can take advantage of improved communications at a comparable cost? For more information, call 301-428-5500, ext. 3751.

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Novell

Continued from page 17

"You could access NetWare 3.11 servers with NetWare Lite, but you had to load the 3.11 shell, and once that's loaded, there's not much memory left to do anything else," he said.

"With [Virtual Loadable Modules], you can just load the Personal NetWare Services module for peer-to-peer connections, load the [NetWare Directory Service] module to access the directory service or load the bindery services module to access the NetWare 3.11 bindery services," Diliberto said. "Or you can load all the modules at the same time and have access to all the servers."

Because Personal NetWare uses the same Universal Client as NetWare 2.X, 3.X and 4.X, upgrades will be easier, as well. Customers looking to upgrade from Personal NetWare to NetWare 3.12, for example, will not have to make any changes at the client. They will only have to set up the 3.12 server and the appropriate connections.

Personal NetWare will also let users load an SNMP agent VLM, an option not available to NetWare Lite users. With an SNMP agent on the personal computer, administrators from a central console will be able to retrieve client system configuration information, such as the amount of memory remaining, the operating system running and more.

Target users for Personal NetWare will be those looking to implement peer-to-peer networking capabilities within an existing NetWare local-area network, the Novell spokesman said.

Personal NetWare will be available by the end of the year for $99 per node, or $395 for a five-user package.

✆Novell: (800) 453-1267.

Artisoft

Continued from page 17

peers, which serve as a gateway letting Simply LANtastic peers access resources on the larger net, including Novell, Inc. NetWare servers.

Simply LANtastic also supports all the add-on connectivity solutions currently made for the LANtastic product line, such as Transmission Control Protocol/Internet Protocol and Apple Computer, Inc. Macintosh connectivity products.

Tyna Callahan, product manager for Simply LANtastic, said the network management products under codevelopment by Artisoft and VisiSoft, Inc., which offer real-time monitoring and inventory management for LANtastic 5.0 nets, will not be supported by Simply LANtastic.

"For people in small offices who don't know the first thing about networking, those options just complicate the process," Callahan said.

Artisoft will offer Simply LANtastic as a software-only product or bundled with network adapters and cabling. The software option costs $79 per node. The bundled package includes the network software, a 10M bit/sec Ethernet-compatible adapter and cabling for $149 per node. Both products will be available in December.

POWERLAN FAMILIARITY

Performance Technology of San Antonio, Texas, is also offering an easy-to-use interface with the latest version of its peer product POWERLan 3.0.

"We went beyond point-and-click and drag-and-drop with this because we've included a lot of animation and have set up analogies that link familiar, everyday situations with configuration functions that walk the new user through the process of setting up the network," Performance Technology President Paul Finke said.

One of the automated features of the Windows-based product lets a user monitor printer activity while running another application. A small icon, called a miniprint monitor, stays on the screen and shows the number of jobs in a print queue, the number of jobs that have been completed and a bar graph of the user's job as it prints.

POWERLan lets a user monitor printer activity while running other applications.

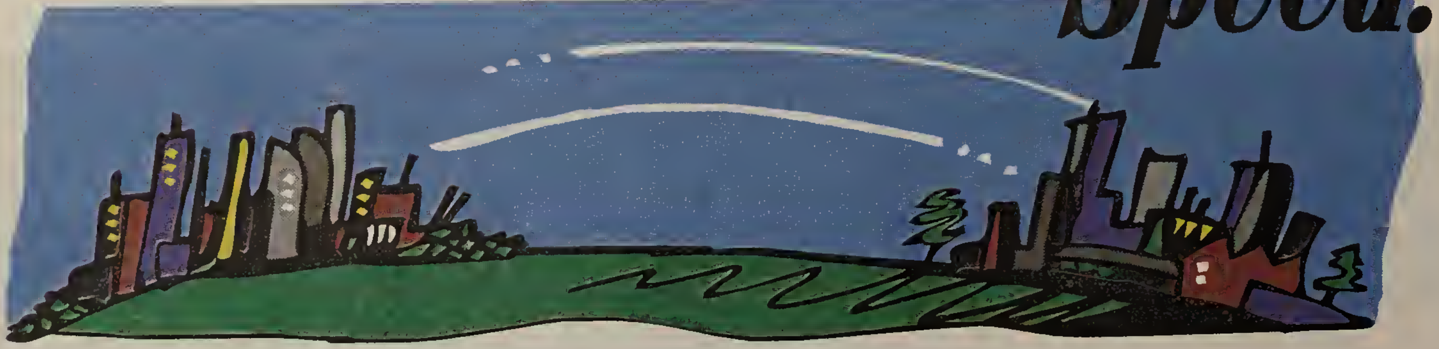
Andy Miller, POWERLan 3.0 product manager, said that while the interface appeals to the novice, the door has been left open for those entry-level networks to expand to dedicated server systems.

Existing versions of POWERLan have a dedicated server option called POWERserve. By making that an add-on and allowing users to add nodes one at a time, the company has positioned POWERLan as a low-end product able to grow with network needs, Miller said.

POWERLan 3.0 will be available next month for $198 for a two-user software-only kit. Additional nodes cost $99 each. A bundled option containing POWERLan software for two users, two Addtron Technology Co. Ethernet NE2000-compatible adapters and 10Base-T cabling is available for $469. A single-user hardware/software version costs $225.

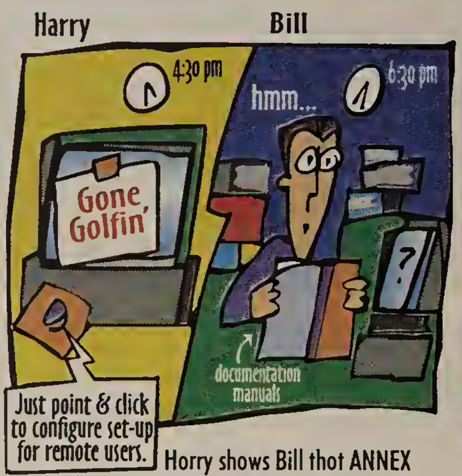
✆Artisoft: (800) 602-7100; Performance Technology: (800)327-8528.

Introducing *something new in remote node connections:* **Speed.**



Harry: minutes to log in
Bill: 1 hour later... still waiting
hmm...

Harry and Bill demonstrate the difference between ANNEX™ LANmodem with *Fast Config* and other remote node products.



Harry shows Bill that ANNEX LANmodem's remote node with *FastConfig* is faster and easier to set up than other remote node methods.

Harry demonstrates why he specifies ANNEX LANmodem as a complete solution.

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THE NETWORK ACCESS COMPANY

Some of the product names mentioned herein have been used for identification purposes only and may be trademarks of their respective companies.

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Circle Reader Service #17

NET RESULTS

by Mark Gibbs

Do your nets work?

A user from yet another company told me that they can't keep their network running. That is the fourth company I've heard from this month complaining about unreliable networks. When you consider that I've been so heads-down since the first of the month that I've hardly been out, to find four companies with this scale problem is astounding.

These organizations are averaging three hours of downtime (or extended coffee breaks as they call them at one company) every week. Let's give those figures a little more thought.

Assuming the average user works (or at least turns up) for around 250 days a year, that's 2,000 work hours per year. If the worker uses a networked computer and they loose service for three hours each week, that's 150 hours per year or just under 8% of their time. Assuming that the employee's fully burdened cost is around $50,000, that's nearly $4,000 per network user that is going down the drain.

In a company with a 1,000-user network, where the average user is on the net for a quarter of their working day, that's a loss of nearly $1 million per year.

You don't have to be an accountant to figure out that this isn't cost-effective. But what may come as a surprise is that MIS and board-level people in these companies don't seem to care. They don't like the outages but the prevailing view is that they are a fact of life. This disinterest also shows up in other areas, even local-area network security.

In two of the firms, the LAN is primarily used as a transport to link terminals to minicomputers and mainframes. Because mission-critical applications live on the big iron, net servers are used for rather mundane purposes such as private file and some personal productivity application storage.

In the other two companies, the nets are relatively new and, although they have sizable user populations, are not yet considered a critical resource — mainly because the firms haven't noticed that they have already become so.

Downsizing is all the rage, but in many companies the process of coming to grips with integrating and migrating legacy applications and planning for mission-critical distributed computing on LANs is a long way off. For the majority of organizations, LANs are a tactical tool, a way of controlling the PC population, not a way of making the corporation more effective.

To put it bluntly, for many MIS groups, LANs are a pain in the butt. They know they need to implement them and they know that trying to shut them out is futile. Their response is to let them put the applications on, create the user accounts, hook up the printers, give some folks who are interested in the job of running the things, and then get back to stuff that looks, well, er, . . . suspiciously like data processing.

For the majority of organizations, LANs are a tactical tool, a way of controlling the PC populations.

A sad example of how loose these networks are is where security is concerned. I guarantee that if you were to check the vast majority of LANs, you'd find them with such open security, you could drive an 18-wheeler through the holes. Sideways.

The point is LANs are serious stuff. You might think the big iron is the heart and soul of the corporation, but it won't last forever.

Traditional systems cost so much more than PC-based network servers and PC workstations and LAN applications are so much cheaper and the licensing is so much better (though usually incredibly inappropriate for LANs . . . but that's another column) that the network solutions will define where the vast majority of corporate computing is done by the end of the decade.

Now is the time to take LANs and distributed, PC-based computing seriously. Make those nets work! Because if you don't, your competition will.

➜ Gibbs is a consultant and writer based in Ventura, Calif. If you'd like to comment, E-mail him on Compuserve, [75600,1002] or on the Internet at mgibbs@rain.org.

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Circle Reader Service #14

GLOBAL SERVICES

Voice, Data and Wireless Services, Regulatory Issues and Voice CPE

BRIEFS

MCI Communications Corp. last week received a three-year, $5 million contract to provide 800, Virtual Network (Vnet) and data services to Morgan Keegan & Co., a large investment firm in Memphis, Tenn. Customers will use any of the firm's 30 toll-free numbers to get stock and bond information, check account balances and open new accounts. Morgan Keegan will use Vnet to handle voice traffic between sites.

The company will implement 56K bit/sec dedicated links to carry stock quotes and verbal market updates (carried as compressed voice) from its headquarters to brokers at each of its 29 branches.

GTE Telephone Operations last week said it has received approval from state regulators to provide X.25 service in nine states, with three more slated for service by month's end.

Users can now order the service, which runs at speeds of up to 64K bit/sec, in California, Florida, Hawaii, Illinois, Kentucky, Oregon, Pennsylvania, Texas and Washington. GTE is awaiting approval from state regulators to offer X.25 service in Indiana, Ohio and North Carolina.

Alternative access provider **MFS Communications Company, Inc.** has joined the Alliance for Telecommunications Industry Solutions, formerly the Exchange Carriers Standards Association. MFS said inclusion in the group will let it team with other carriers to develop standards for net reliability, numbering, operations and billing.

VMX, Inc. has begun marketing the VMX Integrated Voicemail System, which allows incoming calls to be transferred to pagers when workers are away from their desks. The VMX system is based on Motorola, Inc.'s on-site paging system.

VMX: (408) 441-1168.

US West, Inc. has eliminated the leased-line requirement for its switched 56K bit/sec service and is packaging the service with the PictureTel LIVE desktop videoconferencing system at a price of $8,500, which includes the 56K bit/sec interface card. Service rates are set at $42 to $53 per month, with a 112K bit/sec videoconferencing call expected to cost $2.40 per hour.

US West: (303) 965-9252.

COMSAT World Systems, Inc. in Bethesda, Md., has granted an exclusive licensing agreement to Interstate Electronics Corp. in Anaheim, Calif., to manufacture terminals to be used in the bandwidth-on-demand satellite services technology developed by COMSAT Laboratories.

COMSAT plans to launch its "pay-as-you-go" bandwidth-on-demand service once it reaches agreements with other carriers in the International Telecommunications Satellite Organization.

Northern Telecom, Inc. has announced the sale of $159 million worth of its DMS line of digital central office switches to the Henan, Jiangxi, Shannxi and Yunnan provinces in the People's Republic of China. The contracts with the four provinces together call for the installation of more than 160 DMS switching systems.

Bellcore, CableLabs execs detail plans for networks of the future

Fiber/coax systems to deliver bandwidth to the home.

BY BILL BURCH

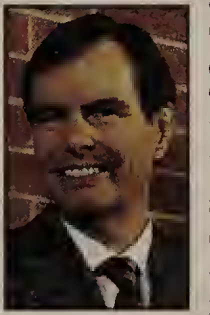
Washington, D.C.

The merger of Bell Atlantic Corp. and Tele-Communications, Inc. has focused industry attention on emerging networks that promise to deliver vast amounts of bandwidth to residential homes, presenting new marketing opportunities for many industries.

Networks envisioned by companies such as Bell Atlantic, US West, Inc., Time Warner, Inc. and Viacom Cable promise a next-generation advertising medium that will allow tightly focused marketing to reach consumers for an instantaneous response. The combination of high-speed pipes and intelligent residential cable television boxes may change the way companies such as travel agencies and financial services firms do business.

To support the new networks, telephone and CATV companies are converging on a common hybrid fiber/coaxial system design.

Leading the research on those networks are Paul Shumate, executive director of access network technology at Bell Communications Research, and Richard Green, president of Cable Television Laboratories, Inc., a research and development consortium for CATV systems operators.


GREEN

The two executives recently discussed the changes in traditional telephone and cable networking that promise to remake both industries.

Over the next few years, users can expect such improvements as highly reliable cable networks and a torrent of two-way bandwidth to homes and businesses, the two executives said.

BELLCORE GROUNDWORK

Just as it did for fiber to the curb, Bellcore is laying the groundwork for telephone companies to install full-service networks. The research organization is currently preparing a special report on the networks, covering the performance of various configurations and the costs of converting to them.

In terms of actual network installations, Bellcore has worked with Bell Altantic on trials of fiber to the curb in Morris County, N.J. In the cable industry, the more common approach to net wiring is a hybrid fiber/coaxial network, which uses fiber to the serving area and coaxial cable in the local loop. US West is using the hybrid approach in Omaha, Neb., where the carrier is installing a network that can provide two-way broadband for the metropolitan area's 1 million subscribers, Bellcore's Shumate said.

In Omaha, the local loop is a mixed bag. Working with nodes supporting 400 homes each, US West is running three sets of lines to consumers. US West is running fiber to the curb for telephony, but it is also running a pair of coaxial lines alongside the fiber.

SHUMATE

On one coaxial line, the carrier will run video with a small back channel for users to communicate with servers. The

See **Future networks**, *page 29*

Bell Atlantic lays out service plans for '94

BY ELLEN MESSMER

Washington, D.C.

Bell Atlantic Corp. will introduce more pricing flexibility and new network restoration services early next year to defend its base of business customers against inroads by competitive access providers (CAP).

In the first quarter of 1994, Bell Atlantic plans to file tariff changes that will, among other things, eliminate the termination charges and penalties on T-1 and T-3 private lines so customers will not be hit with extra charges when they want to reconfigure their networks.

Bell Atlantic has decided to make its tariffed price structure more user-friendly for customers that commit to term plans.

In addition, the carrier plans to roll out a fiber ring-based access service based on Synchronous Optical Network (SONET) technology that will enable users to benefit from SONET's self-healing restoration features.

With alternative access carriers such as MFS Telecom, Inc. and Teleport Communications Group, Inc. raiding its business customer base, Bell Atlantic has decided to make its tariffed price structure more user-friendly for customers that commit to term plans — periods longer than just month to month.

As part of an aggressive new campaign that will last through Jan. 19 of next year, Bell Atlantic has already begun waiving the nonrecurring charges for installation and changes for any of its services. Eliminating these onetime charges means a savings to customers of $1,400 per T-1 line and $10,000 per T-3 line.

And more is to come in a new wave of service options set to debut next year, said Thomas Mazerski, Bell Atlantic's director of special access.

Subject to regulatory approval, Bell Atlantic next year will offer a "preselected term plan" for T-1 circuits that will let customers add other services under the same contract, without having to renegotiate (see graphic, this page).

Customers will also be able to order T-1 lines in bulk from Bell Atlantic's local exchange carriers, eliminating the need to order lines one by one as they do now, Mazerski said.

Another new tariff Bell Atlantic will file is term plan continuation without liability.

"This says as long as the service stays in place after the term ends, the service will be billed at that [term] rate," Mazerski said.

To guard its $40 million in annual interstate T-3 revenue against CAP incursions, Bell Atlantic will eliminate the costly early termination charges its local exchange carriers levy on users.

In the future, if a customer wants to move a T-3 line from one location to another within the Bell Atlantic region, the customer will face no termination penalties for the location from which the T-3 is removed.

Other changes include the introduction of term pricing for multiplexing services and a new seven-year term for T-1 service, up

See **Bell Atlantic**, *page 28*

New in '94 from Bell Atlantic

Preselected term plan
Customers with a term plan for T-1 service can add other services at term rates without renegotiating their contracts.

Bulk ordering for T-1
Customers will no longer have to order line by line.

Term plan continuation without liability
After term ends, customers can continue to receive service at term rates without penalty.

Addition of term pricing for multiplexer services
Term discounts offered for channelized T-3 and T-1 services.

T-1 term plan
Now up to 7 years, up from the previous maximum of 5.

T-3 portability
Customers that buy T-3 service can shift lines from one area to another without termination penalties, as long as they stay within the Bell Atlantic region.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: BELL ATLANTIC CORP., WASHINGTON, D.C.

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Rolm to announce adjunct system to support wireless phones

BY BOB WALLACE

Santa Clara, Calif.

Rolm last week said it will soon announce a wireless adjunct system that lets its existing private branch exchanges support wireless telephones.

Andy Balaschak, product manager for the new system, said it will operate in an unlicensed frequency range designated for public use by the Federal Communications Commission. The new system will support as many as 60 simultaneous conversations.

The PBX vendor joins AT&T, Northern Telecom, Inc., Ericsson Corp. and Spectra-Link Corp. in an-uncing a wireless system.

AT&T joined the fray just last month (*NW,* Sept. 20, page 6).

There are anywhere from 12,000 to 15,000 Rolm 9751 PBXs in use in the U.S., according to Alan Sulkin, president of TEQConsult Group, a Hackensack, N.J., consulting and research firm.

Balaschak said the adjunct will attach via an analog link to any of Rolm's 9751, 7000, 8000 and 9000 CBXs, as well as Redwoods.

The unit uses frequencies in the 902- to 928-MHz range and employs Time Division Multiple Access, a technology that supports multiple simultaneous conversations by assigning each one a specific frequency and time slot.

Balaschak said the system will comprise a main control unit called a radio exchange unit, small radio transmitter/receivers called base stations and lightweight telephones that support the PBX's calling features.

Each radio exchange unit attaches via two pair of twisted-pair wire to as many as 80 base stations, each of which can be up to 300 feet away. Balaschak said each base station can support eight simultaneous conversations.

As employees roam about a facility, their call is handed off to different base stations, which is one reason the adjunct is limited to 60 simultaneous conversations.

The system's wireless telephones weigh less than a half pound and can be used as far as roughly 150 feet from the base station.

Analysts said telephone weight is a key issue. "You don't want the phone to weigh much more [than a half pound] or else they become a pain to lug around," said a source who was briefed by Rolm and requested anonymity. "AT&T's phone weighs close to a pound."

The Rolm system costs close to $2,000 per station, the source said. "That's a little expensive for most Rolm customers. I'm not sure how popular the system will be at that price."

One analyst said there's more to selling wireless switches than just price.

"The wireless PBX sell will be an application-specific sell, something that PBX vendors have little experience with," said Tom Walton, president of Walton & Walton Associates, a Richmond, Va., consulting firm. "They'll have to sell doctors and nurses on using the phones in emergency rooms and resort staff on using them at their facilities."

Rolm: (408) 492-2000.

Rolm's planned wireless switch

Capacity:	60 simultaneous conversations
Compatibility:	Works with Rolm 9751 PBX; 7000, 8000 and 9000 CBXs; Redwood PBXs
Components:	Radio exchange unit, base stations, half-pound phones
Base stations supported:	80
Conversations per base unit:	8
Distance from phone to base station:	Roughly 150 feet
Cost:	Less than $2,000 per station

SOURCE: *NETWORK WORLD*
GRAPHIC BY TERRI MITCHELL

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

Bell Atlantic

Continued from page 25

from the current maximum of five years.

But pricing is not the only area where changes are coming, Mazerski said. "Customers don't want their services to fail, and that's why we're planning services with SONET."

SONET's dual-ring automatic restoration capabilities are well-known, and Bell Atlantic has plans to harness this SONET feature for customers by building SONET rings between local exchange carrier central offices and customer facilities that need high-speed access.

Each of these so-called IntelliLight dual-wire service centers will be capable of providing a high-speed SONET service directly to thecustomer premises, Mazerski said.

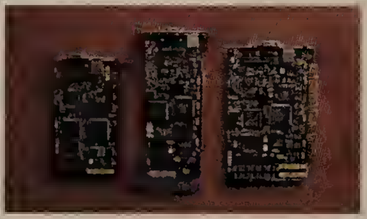
FACILITIES MANAGEMENT

Bell Atlantic also wants to provide facilities management services under three- and five-year term plans to customers with at least one T-1 line. The service would also provide simplified ordering and billing.

But Mazerski acknowledged that Bell Atlantic, which has already filed the tariff for the facilities management services with the Federal Communications Commission, is having trouble winning legal acceptance for the plan.

"The basis of the objections is the prices have no relationship to the costs," according to Cindy Schonhaut, vice president of government affairs at MFS Telecom, which is battling the Bell Atlantic plan at the FCC.

"All of these are cost shifting to keep customers for a long period of time," Schonhaut added.



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NWN4

Circle Reader Service #16

GTE preps new data services

BY ELLEN MESSMER

Pleasanton, Calif.

GTE Mobilnet, Inc., the cellular subsidiary of GTE Corp., last week announced three new data services aimed at mobile workers on the go.

GTE Mobilnet said it will have a cellular modem pool service ready by November that will address modem incompatibility problems as well as a facsimile mailbox service that will let cellular users redirect incoming faxes to a convenient fax machine in a branch office or hotel.

NAPIER

Next year, GTE Mobilnet will start rolling out 19.2K bit/sec Cellular Digital Packet Data (CDPD) service in San Francisco and Houston. CDPD is a digital packet data technology that supports higher transmission rates than most existing wireless packet data services. But firm officials last week said roaming charges — the extra fees users face when leaving their service area — may become a standard facet of CDPD service.

GTE's Mobilnet new cellular modem pool will help obviate the need for remote users to be concerned about compatibility problems when dialing into a host site, a problem compounded by the lack of standards for cellular data modems. With the s WirelessAccess service, users dial into a GTE Mobilnet modem pool, where calls are converted for standard wire-line transmission. Initially, GTE Mobilnet will only support Microcom, Inc. cellular modems, but AT&T cellular modems are expected to be added soon.

PATRIDGE

To tackle the problem of keeping up with incoming faxes while traveling, GTE Mobilnet will offer a fax mailbox to which users can have faxes sent and stored, said Chuck Napier, director of marketing for wireless data at the GTE telecommunications products and services group. While traveling, users can then redirect faxes from the mailbox to any other number. If the fax is sent to another subscriber of the service, users can also attach a voice message.

GTE's Mobilnet announcement of CDPD services comes as no surprise, since the company firmed up its service plans earlier this month after winning a contract from Westinghouse Electric Corp. for bulk CDPD service (*NW*, Oct. 11, page 28).

Russ Patridge, vice president and general manager for GTE Mobilnet's Pacific region, said it will have CDPD available in the metropolitan areas of the Southeast, Florida, Texas, the Midwest, California, Oregon and Hawaii by year end. The firm declined to discuss CDPD prices, saying only that there may be a choice of flat-rate or by-the-packet service fees.

The firm is striving to connect its CDPD net with those of other providers to create a national CDPD infrastructure.

Future networks

Continued from page 25

capacity of the other coaxial cable is split to provide 200 MHz in each direction.

Both Bell Atlantic's and US West's networks will be able to support networking demands for the next several years, Shumate said. Applications planned for deployment in the next few years will not make much of a demand on the back channel, relying on it mainly for control of video services and some in-home shopping.

Future systems will provide 50M bit/sec downstream and a T-1 back channel, plenty of bandwidth for videoconferencing and fast file transfers, he said. After the turn of the century, Shumate predicted, networks will have a 155M bit/sec channel to customers and a return channel of 52M bit/sec, the standard Synchronous Optical Network (SONET) Optical Carrier (OC)-1 and OC-3 rates.

"In a decade, that will probably be about right," he said. "But right now, you can do a great deal with 52M bits, and that's essentially what the [Bell Atlantic] system in Morris County provides right now."

Paradoxically, the networks of the future that Bell Atlantic and US West are deploying are only temporary solutions, Shumate said. Over time, the shift to digital will force carriers to drop coaxial for fiber in the local loop.

"The only reason you put [coaxial] in really is to bring in broadcast services that are compatible with today's television sets," Shumate said. "But as those TV sets begin to develop a digital interface, it's harder to provide digital services over coax than it is over fiber."

CABLELABS' VISION

On the cable side, CableLabs' Green offered a broader vision of the technological evolution of broadband networks over the next several years. Cable networks will evolve through four stages, according to Green.

Ten to 15 years ago, cable companies built up their networks for the launch of premium programming. That infrastructure is now reaching the end of its life cycle, and cable companies are moving to the first stage of network evolution by replacing the backbone net with fiber and constructing hybrid fiber/coaxial nets, Green said.

After the hybird networks are in place, digital transmission will be next. CableLabs has been working on digital transmission and compression technologies for three years, Green said. Cable companies will begin installing the first such systems next year.

Once cable companies standardize on digital transmission, they will be able to more easily interconnect their nets. As in the wide-area network world, interconnection will be over a metropolitan-area ring, letting carriers interconnect for interoperability and economies of scale.

The final frontier for the cable carriers will be incorporation of distributed processing. CableLabs has been designing a system architecture based on a distributed client/server model where the client is the set-top box, and the network service center houses the server.

So far, companies working on full-service networks include Time Warner in Orlando, Fla., and Viacom in Castro Valley, Calif., and others are getting ready to come on-line. Carriers currently have 2.6 million of the advanced set-top boxes on order now, and network infrastructure installation will begin next year, Green said. In five years, the new networks will be the dominant cable architecture, he predicted.

For business users, the knock on cable networks has been lower reliability. While the phone industry has averaged 99.99% reliability, cable networks haven't done better than 99.7% to 99.8%, Bellcore's Shumate said. In minutes, those rates translate to 53 minutes per year in telephone outages and 1,500 minutes per year for cable systems. Also, system reliability has varied by a factor of six across different cable companies.

The biggest problem for cable has been power outages. While telephone companies have equipped their nets with battery backups, cable companies are only now installing uninterruptible power supplies that cannot be taken out by a lightning strike on a telephone pole, for example.

RATE & TARIFF MONITOR

by David Rohde

Private lines for less — it's all in the name

Encouraged by the long-distance carriers, end users are now ordering DS0 (64K bit/sec) digital data circuits in the new "generic" or "hubless" formats that don't require carrier supervision through regional hub centers, hence, costing less. But if you want to compare costs for these less expensive digital data lines, you have to know the carriers' tariff lingo.

One carrier might call a DS0 circuit one of their "fractional T-1" services, while another might call it one of their "DDS" services when they're really the same thing. The payoff is that if you know which carrier calls it an apple and which an orange, you might get a DS0 line on really good terms.

Consider the difference between AT&T and MCI Communications Corp.

Before the carriers started offering hubless services, AT&T offered the popular Dataphone Digital Service for high-speed data transmission. It was imitated by other interexchange carriers and many Bell operating companies, but it cost a pretty penny. That's because the lines had to be routed through regional hub centers and the carrier provided 24-hour circuit supervision.

Dataphone Digital Service is still tariffed, but if you look up a key rate element — the interoffice channel rates — you'll find that the mileage charges are steep. For example, a 250-mile, 56K bit/sec circuit costs $608.95 plus $2.47 per mile every month.

To move users to hubless lines, AT&T introduced them to its Accunet Spectrum of Digital Services (ASDS). The name "Accunet" clues you in that you're now dealing with AT&T's T-1 family of services; in fact, ASDS is frequently referred to as a fractional T-1 service. But at 56K/64K bit/sec, it has the same effect as a hubless digital data line. And look at the difference in rates: A circuit of any length costs only $281 plus 33 cents per mile for the interoffice channel.

MCI's approach was a little different. To move users to hubless data circuits, the carrier introduced Digital Private Line and placed it under a separate umbrella than its T-1 family, which is called Terrestrial Digital Service. But for a 56K/64K bit/sec circuit, MCI's Digital Private Line has the same effect as AT&T's ASDS.

In fact, a quick look at the rates shows that MCI's Digital Private Line holds a slight advantage over AT&T: A circuit of any length costs $249 plus 30 cents per mile for the interoffice channel.

Plus, MCI offers city-pair discounts under which if you order, say, five circuits between the same two cities, you get a 5% discount. (Both carriers offer term and volume discounts, as well.)

Keep your hat on — it's even a little dicier to compare rates for intrastate service.

While AT&T has filed intrastate ASDS rates in 42 states, we've tracked intrastate MCI Digital Private Line rates for only nine states: Arkansas, California, Florida, Georgia, Indiana, Massachusetts, Minnesota, Missouri and Ohio. But don't assume you can't get the service from MCI in the other states. Just ask, and the carrier may be able to provision the service on an individual case basis if adequate facilities exist.

For a comparison of actual tariffed rates, look at California. AT&T monthly interoffice channel rates for a 150-mile circuit run $248 plus 32 cents per mile; MCI rates run $228.16 plus 29 cents per mile.

The real fun comes when you try to find a hubless DS0 circuit to connect two points within a local access and transport area. You have to go to the local exchange company's tariff, but if you're lucky, you may find a real opportunity.

Consider US West, Inc.'s general exchange tariff filing in Oregon. Not only does the telephone company offer a hubless service called Digicom I, it now offers a second hubless service, called Digital Data Service, in two specific metropolitan areas: The Interstate 5 corridor running south from Portland to Salem, and the Eugene/Springfield area.

Under this second service, the interoffice channel mileage charge is waived entirely if you connect two points within these areas. Or you can connect a point of termination just outside these areas for a flat charge of $40 a month.

Of course, there are installation charges, channel performance charges and optional features, but it's obvious that the telephone company is encouraging use of this new service.

Rohde is associate publisher of the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 292.

Before Boundary Routing
Bank was being held

Next to armed bandits, the thief bankers fear most is time.

Lose a day here and a day there, when updating loan and mortgage information, and you just might lose a few customers, too.

For United New Mexico Bank, heading that problem off at the pass led to a unique and innovative remote office networking system from 3Com called Boundary Routing System Architecture. With 3Com's Boundary Routing technology installed, all of United New Mexico's 28 branches receive up-to-the-minute financial information. Without delay.

No technicians must visit the branches. No new network staff must be added. One network administrator at the bank's headquarters can handle it all.

"Before extending our network to the branch offices, changing master loan and mortgage documents was very time-consuming," recalls Dan Langenwalter, Vice President of Technical Services for the bank. "It took two to five days just to revise the software applications. We had to route update diskettes

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the United New Mexico up on a daily basis.

to each branch. And we had no control over what happened to the diskettes once they got there. Someone could slip them under a pile, and they could be lost for weeks."

Now, Langenwalter proudly notes, changes to the network are made within minutes, from headquarters, where the experienced network administrators are. And administrative costs have been virtually eliminated at the bank's remote sites.

"The result," he says, "has been the best of both worlds: the benefits of routing without the complexity."

Bankers aren't the only ones who have discovered that 3Com's Boundary Routing technology is the simplest and most cost-effective way to add branch offices to the corporate network. For a free video, *Plug and Play Remote Networking*, along with complete product information, call **1-800-NET-3Com.** You'll find answers to remote office networking problems that have been holding you up, too.

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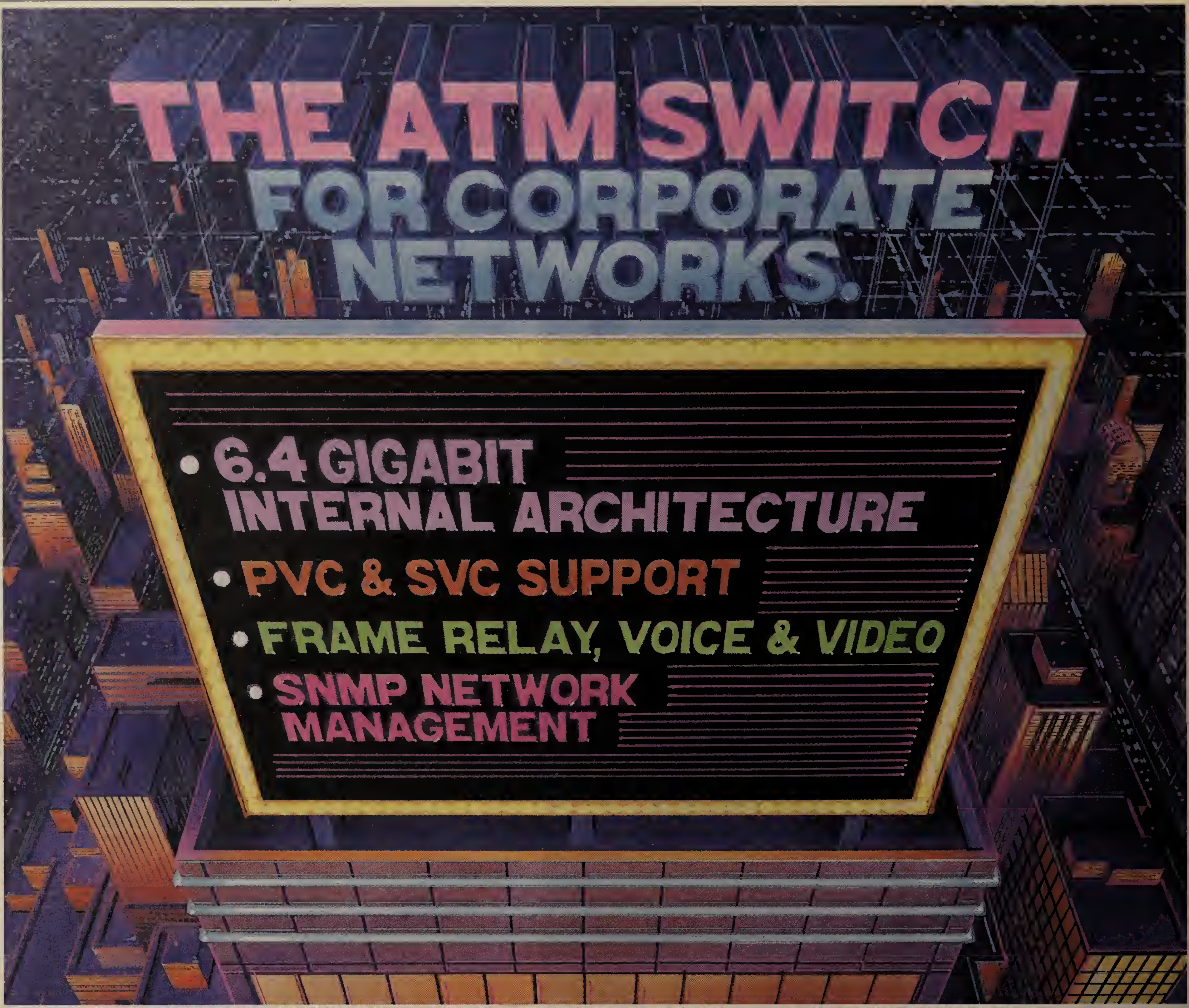
Circle Reader Service #12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Circle Reader Service #2

CASE TOOLS

KnowledgeWare deploys client/server repositories

BY WAYNE ECKERSON

Atlanta

KnowledgeWare, Inc. recently beefed up the workgroup capabilities of its flagship Application Development Workbench (ADW) tool for planning, designing and generating client/server applications.

The Atlanta firm has added three client/server repositories to its ADW computer-aided software engineering (CASE) tool that make it easier for groups of developers to share information, such as data models, code and objects, and collaborate on software development projects.

KnowledgeWare developed two of the client/server repositories and licensed the third one, Rochade Repository, from R&O GmbH in Munich, Germany. Rochade is one of two standalone client/server repositories in the market today. It runs on a variety of platforms and enables users to integrate data models and program information from multiple vendors' CASE and application development tools.

Groups of programmers use repositories to store and share information about the client/server programs they are developing. Repositories, which KnowledgeWare also calls encyclopedias, are critical for building large, complex applications. Until now, most client/server development tools were designed for individual developers who generated applications from beginning to end.

Until now, most client/server develpment tools were designed for individual developers.

ADW is providing three tiers of repositories, with each tier having the ability to feed information to the repository in the tier above it. This enables users to consolidate information about all of their software programs in a central place. This also makes it easier for users to assess the impact that changing a core data structure – such as adding digits to customer ID number codes – will have on all their applications.

3 PARTS TO A WHOLE

At the bottom tier, KnowledgeWare has deployed the ADW/Workgroup Coordinator, a local-area network-based repository that runs on Novell, Inc. NetWare and IBM LAN Server networks, and supports as many as 10 programmers. It provides multiple developers with concurrent access to the repository to create, read, update and delete information. In addition, the repository allows each developer to view simultaneously the work of other developers across the network, improving the productivity of the group.

Users can consolidate information about all of the software programs in a central place.

Each ADW/Workgroup Coordinator repository feeds information across a net to the ADW/Workgroup Manager, a second-tier repository that consolidates the information into a departmental or divisional master repository. The ADW/Workgroup Manager, which runs on an OS/2 server, contains a security mechanism that allows administrators to grant individuals read and/or write access to objects in the repository. It also provides a change management tool that gives administrators a graphical view of changes made to an encyclopedia.

Finally, users can deploy the Rochade client/server repository to gain an enterprise view of data and programs developed with ADW and other third-party development tools, such as Intersolv, Inc.'s Excelerator.

Rochade, which runs on Unix, OS/2, DOS/Windows and MVS platforms, provides change and version control, impact analysis and report capabilities. It enables users to integrate all CASE and client/server development tools within their organizations.

To transfer information from one or more ADW/Workgroup Manager repositories to the Rochade repository, users must utilize a proprietary interface supplied by Knowledgeware called OpenADW.

The ADW/Workgroup Coordinator and Rochade Repository are available now, and the ADW/Workgroup Manager will ship during the first quarter of 1994.

The ADW/Workgroup Coordinator costs $10,000 per server, while the Rochade Repository ranges in price from $140,000 to $200,000, depending on the number of clients. Pricing for the ADW/Workgroup has not been determined.

©KnowledgeWare: (404) 231-8575.

DEC realigns to boost its distributed computing efforts

One group to handle ORBs, messaging, OLTP and DCE.

BY WAYNE ECKERSON

Nashua, N.H.

Digital Equipment Corp. is quietly reorganizing internal product groups to bring its distributed computing strategy into sharper focus and offer an integrated suite of technologies supporting distributed applications.

DEC is in the final phases of creating the Distributed Computing Software group that will market and develop products based on four distributed computing technologies: object request brokers (ORB), transaction monitors, message-oriented middleware and distributed computing software based on the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE).

Currently, DEC has separate development and marketing groups for these products. Consolidating the groups will create more synergy between the product lines and enable DEC to offer a flexible strategy for integrating a variety of distributed computing technologies, according to Anne Thomas, DEC's product manager for tools based on the Object Management Group's Common Object Request Broker Architecture.

What's interesting about the realignment is that it is the result of a grass roots movement.

Earlier this year, developers working on DEC's ObjectBroker distributed object management system, DECMessageQ middleware and DCE products banded together to push for the creation of a new division in which they could work more closely together. This group later persuaded managers of DEC's Application Control and Management System (ACMS) transaction monitor system to join, Thomas said.

"We all wanted to work together within a single group, and we pushed to make it happen," he added.

According to Thomas, DEC is finalizing organizational charts for the new group, which will be part of DEC's Network Engineering group run by DEC Vice President Larry Walker. The Network Engineering group handles everything from hubs and routers to

See **Digital**, *page 38*

DEC's distributed computing strategy

Digital Equipment Corp. is in the process of organizing a Distributed Computing Software group that will manage the following products:

ObjectBroker

DEC's distributed object management system

DECMessageQ

Message queueing software that runs on Unix and PC platforms, and works across LU 6.2, DECnet and TCP/IP

DEC's Distributed Computing Environment (DCE)

DEC's implementation of the Open Software Foundation, Inc.'s DCE, which runs on VMS and OSF/1

Application Control and Management System

DEC's transaction monitor that runs on DEC's VMS and OSF/1, and supports Apple Computer, Inc.'s Macintosh, Ultrix, DOS and Windows clients

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: *NETWORK WORLD*

BRIEFS

Visix Software, Inc. last week announced a new version of its Galaxy Application Environment cross-platform applications development tool. Version 2.0 adds three new utilities and enhances several others that simplify specific tasks in the application development process, such as building print and list functions. The new release also supports the Windows Multiple Document Interface and offers an improved graphical user interface tool. The C version costs between $7,800 and $9,600 per developer seat, while the C++ version costs $12,100 per developer seat.

Visix: (703) 758-8230.

Cincom Systems, Inc. last week began shipping XpertRule 2.1, a Windows-based tool that enables developers to rapidly prototype and develop expert systems. The new version contains a utility that allows developers to capture an expert's knowledge using learning-by-example techniques and represents that knowledge graphically as a decision tree. The product costs $990, but is available for a limited time for $495 to users of other personal computer-based expert system tools.

Cincom: (800) 543-3010.

Gupta Corp. and **Informatica Corp.** last week announced a marketing agreement in which Gupta will resell Informatica's RightStart tool kit. RightStart is Windows-based software that helps developers accelerate the migration of data in legacy systems to distributed client/server environments.

Informatica: (310) 479-4601.

The Petrotechnical Open Software Corp. (POSC) last week announced that it will begin shipping in mid-December prototype software based on POSC's Data Access and Exchange specification. The software provides vendor-independent access to technical information stored in multivendor databases. The specification is designed to facilitate the exchange of complex technical data between project teams within or between companies. The source code for the software costs $20,000 for POSC members and $25,000 for non-members.

POSC: (713) 784-1880.

MCI International and **Delrina Corp.** recently announced that MCI will make Delrina's facsimile and forms-routing products available to users of the MCI Global Messaging Services. The partnership will offer enhanced messaging services, including enhanced fax, E-mail, enterprisewide groupware and forms-based electronic commerce.

MCI: (914) 934-6480.

GROWTH

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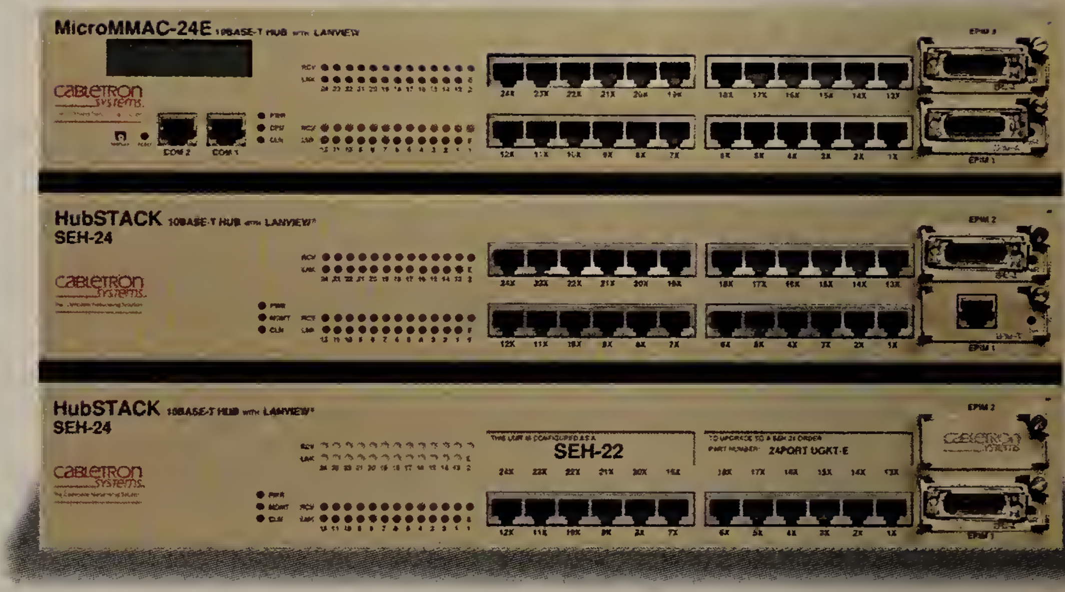

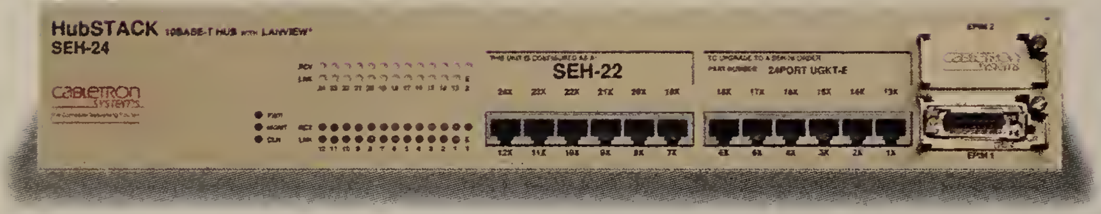

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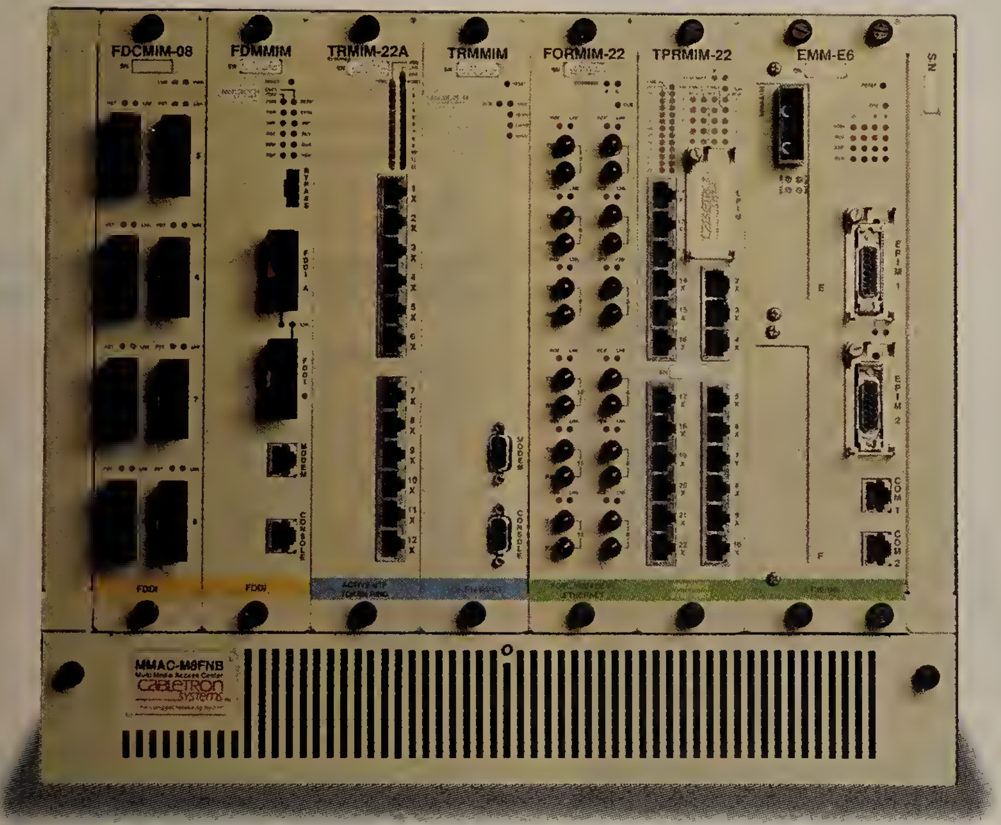

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Circle Reader Service #11

Information Builders to roll out client access to CICS, IMS

Connectivity builds on EDA/SQL Server capabilities.

BY PETER LISKER

New York

In the world of corporate computing, CICS and IMS still reign supreme as the basis for mainframe transaction processing databases. Yet users that rely on this technology must adapt to the increasingly popular client/server computing model.

To meet the needs of these users, Information Builders, Inc. has announced the Enterprise Data Access (EDA)/SQL Transaction Server. This extension to IBI's flagship EDA/SQL Server product is designed to let users build client/server applications and use front-end development tools for accessing CICS and IMS systems.

By leveraging the capabilities of EDA/SQL Server, the transaction server will also allow the integration of more than 50 databases with mainframe CICS and IMS databases running under IBM's MVS/ESA operating system.

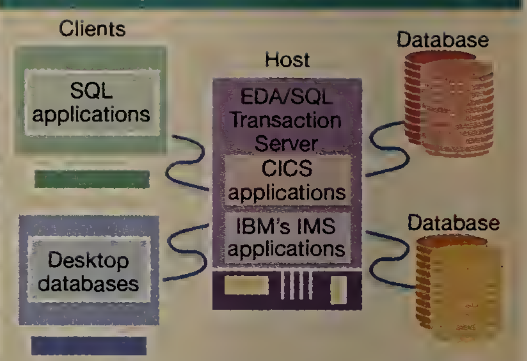
"We believe that CICS and IMS are still the fundamental components for the majority of mainframe transaction applications that companies use to run their businesses," said Charles Small, director of marketing for IBI's EDA division. "With EDA/SQL Transaction Server, these companies can now take advantage of increasingly powerful and cost-effective client/server technology without the need to scrap their existing CICS and IMS applications."

IBI's new software will utilize a VTAM-based engine that runs on a mainframe and invokes CICS and IMS transactions there. EDA/SQL Transaction Server works in tandem with EDA/SQL's API/SQL client software and EDA/Link network protocol software to invoke EDA/SQL remote procedure calls (RPC). These RPCs pass information from clients to the mainframe databases.

The transaction server allows users to develop applications across a large number of client platforms via a single application program interface.

A primary benefit of the EDA/SQL Transaction Server is that it allows users to develop applications across a large number of client platforms via a single application program interface called API/SQL. IBI's API/SQL interface can be embedded directly into applications to give them access to mainframe databases.

IBI's EDA/SQL Transaction Server



IBI's Enterprise Data Access (EDA)/SQL Transaction Server provides connectivity between client applications and databases, and CICS and IMS applications running on host computers. EDA/SQL Transaction Server is an add-on product to IBI's EDA/SQL Server, which provides client access to relational and nonrelational databases.

SOURCE: INFORMATION BUILDERS, INC. (IBI), NEW YORK
GRAPHIC BY TERRI MITCHELL

The EDA/SQL Transaction Server supports clients running on IBM's OS/2, DOS, Windows, Digital Equipment Corp.'s VMS, Apple Computer, Inc.'s Macintosh and Unix, among other operating systems.

IBI also offers EDA Access and Database Extenders, which are direct interfaces to client applications, such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Excel spreadsheets.

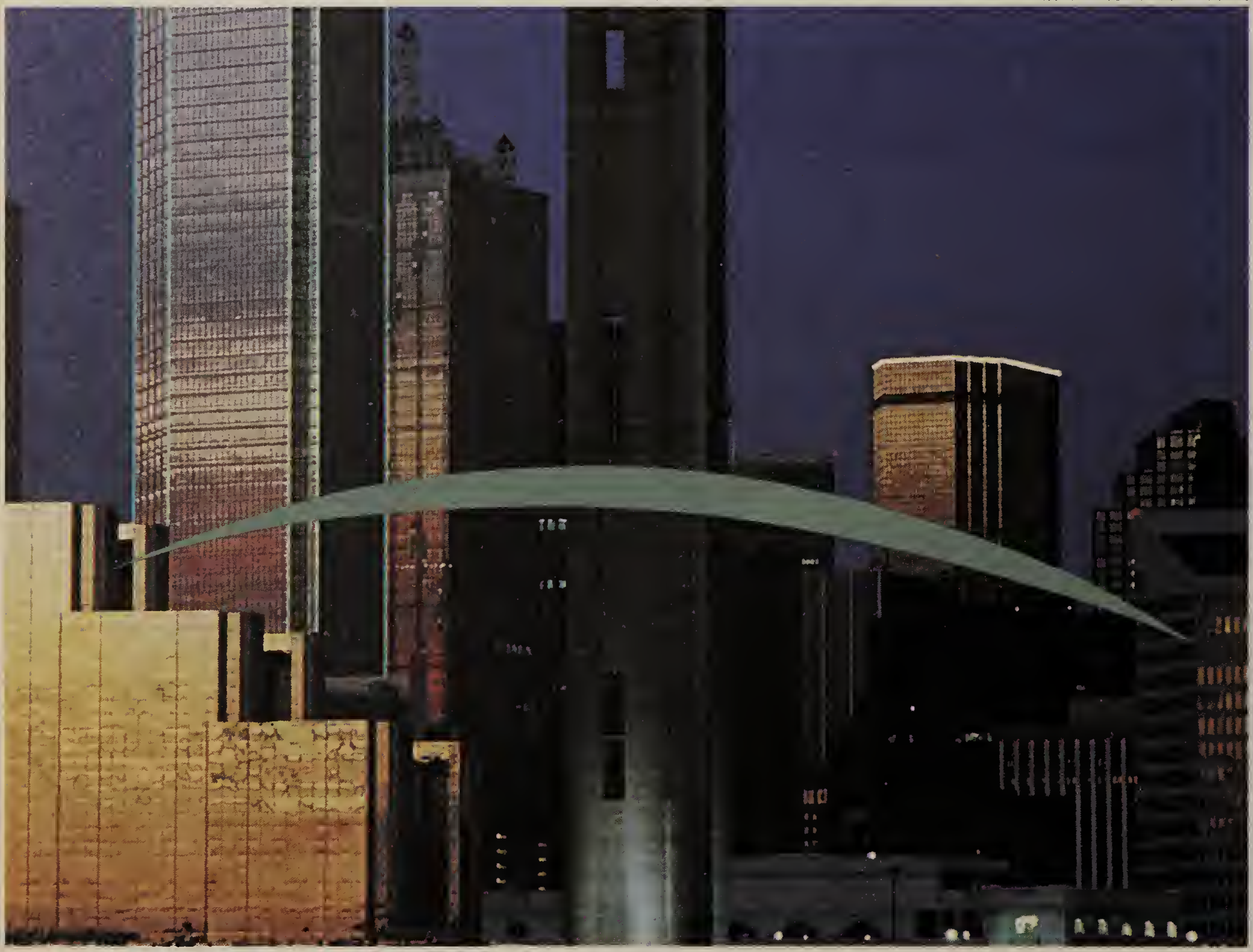
In addition, data drivers from IBI allow data from non-IBM databases to be utilized by CICS and IMS. IBI offers data drivers for databases and development tools from Oracle Corp., Sybase, Inc., Informix Software, Inc., Ingres, DEC, Teradata, Inc., Unify Corp. and others.

The EDA/SQL Transaction Server will be available on CICS/ESA and IMS/ESA systems in December. Prices range from $28,500 to $46,900.

✆IBI: (212) 736-4433.

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.



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Circle Reader Service #5

INTERNETWORK MANAGEMENT

Understanding SNMP and SNMPv2

According to IDC (International Data Corporation), the installed base of internetworking devices has been growing at an average annual rate of over 65% for the past four years.

With this explosive growth comes the need for network management systems to simplify management operations. The SNMP (Simple Network Management Protocol) has rapidly become the de facto standard for these management systems.

In this information packed one-day seminar, you will acquire a thorough understanding of the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats, improved error codes and security with SNMP version 2.

A special feature of this seminar are case studies, taken from live networks, and demonstrated with a Network General Sniffer® protocol analyzer.

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- Understand the Agent/Manager model of network management.
- Compare and contrast the ISO, IEEE and Internet network management architectures.
- Learn how major vendors are supporting SNMP, including Apple Computer, Cabletron Systems, DEC, Hewlett Packard, IBM, NCR, Novell, and SunConnect.
- Learn the details of the three key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP.
- Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats.
- Understand how TCP/IP and the related Internet protocols such as UDP and IP support SNMP.
- Learn how test equipment that supports the Remote Monitoring (RMON) MIB can assist with distributed LAN management.
- Understand the enhancements found in SNMPv2, such as Manager-to-Manager communications, the GetBulk Protocol Data Unit, and enhanced Security.
- Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems
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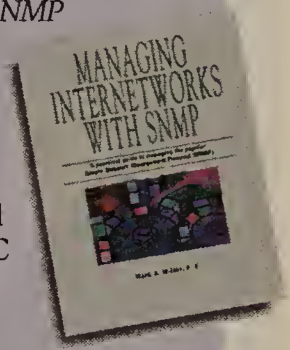

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Users stand by DB2 as strategic database system

BY PETER LISKER

Copenhagen, Denmark

Despite challenges from alternative database management system products on client/server platforms, IBM's DB2 database system continues to have the strong support of current users and figures prominently in their strategic database server plans.

A survey of users at 317 DB2 sites released at the International DB2 User Group meeting here finds that 78% of users plan to increase their use of DB2 for major applications.

The survey was commissioned by Candle Corp., a Santa Monica, Calif.-based supplier of management software for host systems from IBM and other vendors.

The survey shows that many users plan to make DB2 systems a fundamental component of their enterprise relational server strategies during the next two years. DB2 will evolve into the predominant enterprise relational server by 1995 for 51% of those surveyed.

Another interesting trend that turns up in the survey is that 47% of those surveyed have already begun to implement distributed database systems using DB2. That means IBM is well positioned to cash in on the increasing acceptance of distributed database solutions as an important component in enterprise distributed application systems.

"It's very heartening from IBM's viewpoint to see such satisfaction from DB2 users about the product, particularly their solid support of the distributed options that DB2 has," said Jan Lewis, president of Cupertino, Calif.-based Lewis Research.

Although support for DB2 on the mainframe is high, the survey finds a decidedly mixed picture regarding other database platforms. Approximately 70% of users surveyed have not made a purchase decision for non-mainframe relational DBMSs, although they plan on purchasing such systems. The survey finds 11% of users committed to buying either DB2/2, which runs on OS/2 personal computers, or DB2/6000, a RISC System/6000-based product from IBM.

These numbers indicate a significant opportunity for IBM's competitors to bring their products into Big Blue shops.

A complete copy of the report will be available in two weeks from Candle.

©Candle: (310) 582-4263.

Digital

Continued from page 33

network operating systems.

At the heart of DEC's distributed computing strategy is OSF's DCE, which provides core directory, time and security services needed to connect distributed applications in a heterogeneous computing environment.

WALKER

Thomas said the Distributed Computing Software group will modify ObjectBroker and DECMessageQ to utilize DCE services, replacing proprietary directory and security services in the products.

This would be done by building interfaces between the two products and DCE. Thomas did not mention how DEC would integrate ACMS with DCE.

"We feel DCE services are essential and should be utilized by any environment that is doing distributed computing.

Thus, object request brokers and message queuing systems should be layered on top of DCE and make use of DCE services to provide consistent naming and security features," Thomas said.

By integrating its distributed computing products via DCE, DEC provides an attractive package to users who want to develop enterprise applications using a variety of application connectivity paradigms.

The strategy gives users the option of deploying remote procedure calls (RPC), message-oriented middleware or ORBs to access DCE services. OSF only provides an RPC interface to DCE services.

"You are not required to use DCE RPC to access DCE services. We want to give programmers the choice of using three interfaces to get to DCE," Thomas said.

She did not say how long it would take DEC to modify its distributed computing product line to take advantage of DCE services. However, products such as DECMessageQ do not have security services, which would make the transition easier.

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Editorial

With all that's going on in Somalia, Haiti and other hot spots, with the challenges of NAFTA and health care reform ahead, it would be easy for the Clinton administration to put the National Information Infrastructure effort and telecommunications policy reform on the back burner.

But that would be a mistake with profound ramifications for the future.

As the AT&T/McCaw Cellular and Bell Atlantic/TCI deals prove, the telecommunications industry – with help from the entertainment and computing worlds – is quickly reshaping itself in a way that promises to revitalize our economy, providing new platforms for products and services and new ways for companies to reach consumers.

But, as Contributing Editor Alan Pearce explains in a special analysis piece this week (see page 1), the regulations that govern the industry haven't kept pace with change; they threaten to stunt the growth of the information superhighway and warp the future of the industry. The many organizations that control the industry in one form or another have conflicting agendas, and the hope of bringing any semblance of order to telecommunications policy can only be realized if the Clinton administration takes the lead.

But it's not just policy experts such as Pearce who are concerned about the regulatory tangle. In the wake of recent mergers, we commissioned a survey of readers that indicates a real desire for change (see page 1). While clearly dissatisfied with the level of competition in the local loop, users nonetheless see a distinct need to modify the regulatory restraints on the Baby Bells. In simple terms, users think current policies are confusing and out of touch with the realities of the marketplace.

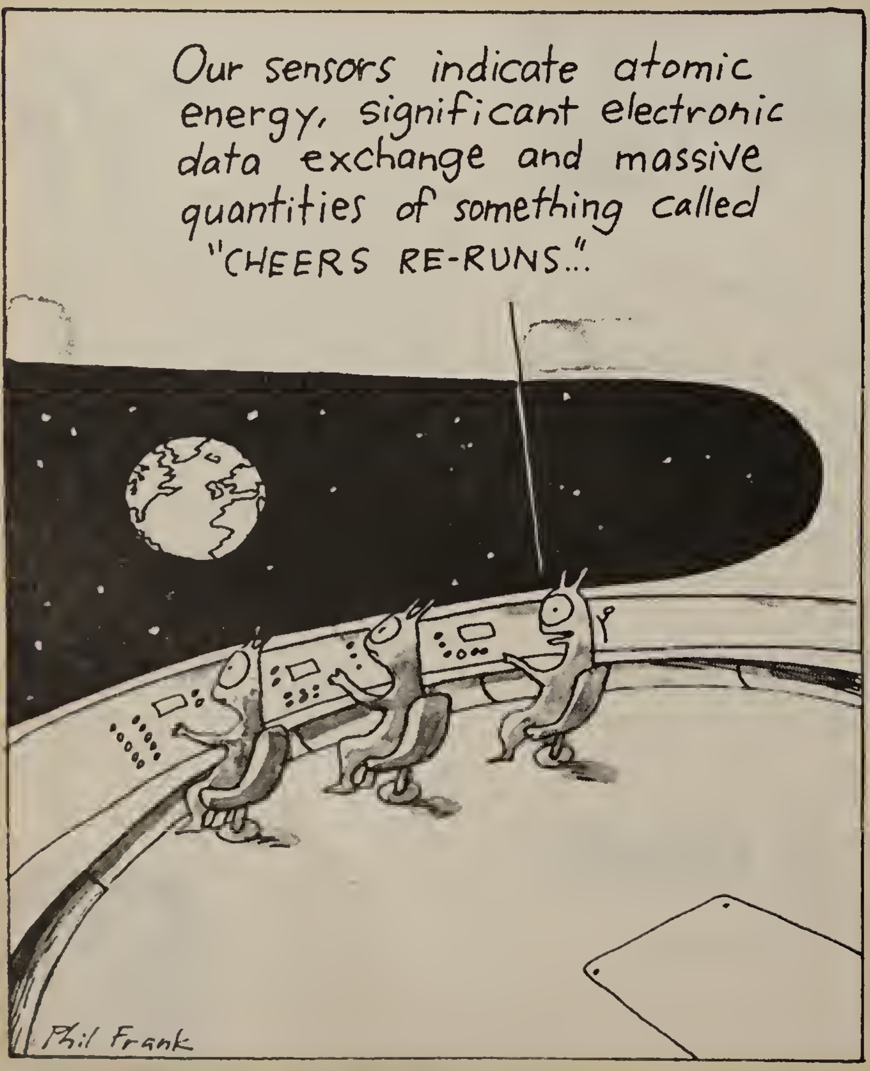
A couple of weeks ago, I cited a particular example of this policy gridlock involving a court decision that appeared to free Bell Atlantic to offer cable programming in its operating region (Oct. 11, page 38). That case has gotten even more convoluted with the Department of Justice's decision to appeal the ruling – the same Justice Department that has favored removing the cable restraints. That move clouds the merger picture for Bell Atlantic and TCI and further confuses the issues.

What's clear from all the gyrations in the industry is that the U.S. stands poised to dominate a new world order in information and communications. But to achieve that, the Clinton administration has to get the policy roadblocks out of the way.

JOHN GALLANT

Teletoons

FRANK AND TROISE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Phil Frank

MACROSCOPE

by James Kobielus

Directory synchronization: too vital to leave to vendors

Directory synchronization standards should be put on the network industry's fast track. They are the tail that will wag the X.500 dog, ushering in an era of truly transparent, cross-platform, global naming services.

It's a tad disappointing that in 1993, five years after the release of the initial X.500 specifications, there are still no standards and precious few commercial tools for synchronizing vendor-proprietary directories across diverse electronic mail systems, LANs and other communications environments.

Users should be clamoring for directory synchronization standards. Directory synchronization tools allow network managers to realize many of the benefits associated with X.500-compatible enterprise directories – such as transparent multivendor networking and streamlined service administration – while protecting investments in directories on legacy communications and computing platforms.

You need directory synchronization tools because you can't afford to wait for universal X.500 to become a reality. It would be futile, for example, to wait for the vendors of the five E-mail packages used in your company to converge on a common implementation of X.500.

What your end users really want is the ability to look up addresses on external E-mail systems so they can send mail to remote personnel. Directory synchronization tools support this cross-platform messaging integration by periodically uploading directory entries from scattered systems, merging the entries and then broadcasting the changes to all system directories.

Fortunately, the networking industry has begun to address the need for directory synchronization standards, but a consensus specification may not emerge for one to two years. The X.400 Application Program Interface Association (XAPIA), Electronic Mail Association (EMA), and major E-mail and network vendors have formed a working group to explore directory synchronization issues prior to drafting an open specification.

Directory synchronization standards are too important to be left solely to network vendors. There needs to be more user involvement in the XAPIA/EMA working group, lest directory synchronization standards fall into the same talk-shop quagmire that has slowed implementation of X.500 and other Open Systems Interconnection standards.

Why have vendors neglected directory synchronization issues for so long? One explanation may be their long-standing preoccupation – at users' prodding – with building X.500-compatible and quasi-X.500 global naming services for their own network environments. Each vendor acts as if it believes it is creating the mother of all directories that will magically integrate with all other companies' naming services in the not-too-distant future.

Vendors may also have neglected directory synchronization because it might have short-circuited users' interest in X.500, which has been stuck in vaporware mode for years. Even Banyan Systems, Inc. – the pioneering vendor of local- and wide-area network global naming – has yet to ship a commercial, X.500-compliant directory service.

Pity the poor network manager these days who has to synchronize multiple, overlapping, incompatible enterprise directories – all of which claim some resemblance to X.500.

Until universal, cross-platform, seamless X.500 becomes a reality, directory synchronization tools will be a necessary element in the network manager's bag of tricks. And until a de facto or de jure directory synchronization standard is established, users will have to use proprietary tools from such companies as Soft-Switch, Inc. and Retix, or – more likely – develop homegrown solutions.

Mere standards, however, are not enough. The networking industry needs to do a much better job of educating users on the daunting technical and administrative challenges in fully migrating to X.500 via directory synchronization. Global directory services will make possible – indeed, almost require – cross-enterprise reengineering of network management roles and procedures.

In conjunction with its future directory synchronization standards documents, XAPIA/EMA should develop guidelines for users contemplating implementation of global directory services. These guidelines should include:

- The establishment of an enterprise global naming scheme to provide each user, device and resource on the network with a unique, hierarchical, logical identifier.
- Designation of an organizational directory/name administrator who is responsible for overseeing registration of new user/resources under the naming system and for ensuring the directory's internal integrity, consistency, accuracy and completeness.
- Use of an existing directory as the nucleus of the master enterprise directory, to be populated through directory synchronization or X.500 technologies. A company's electronic phone directory – which already serves as a registration point for user organizational, location and telephone information – could serve as a collection, consolidation and reconciliation point for platform-specific directory information registered through systems administrators.
- Introduction of cross-platform directory services, either through directory synchronization or X.500, in phases consistent with business priorities. Since E-mail interoperability is a near-universal concern, companies may want to focus initially on pressuring strategic E-mail vendors to link their respective directory synchronization and X.500 schemes.

Directory synchronization will be a necessary evil until the far-off day when vendors coordinate their X.500 strategies. Without directory synchronization standards and tools, users will continue to suffer from conflicting, incompatible directory services.

Kobielus, a contributing editor to *Network World*, is a telecommunications analyst with Fairfax, Va.-based Network Management, Inc., a local- and wide-area network systems integrator. He can be reached at (202) 218-4362.

NETWORK OUTAGES

by Michael Perez

Failure to plan has high cost

It is crucial for user organizations to take the time to perform a detailed failure analysis that measures the associated costs, in lost business, of network outages. Network managers who don't do a failure analysis often cannot justify the expenditures required to prevent or survive a network disaster and, thus, put their organization (and job) at risk. Alternatively, net managers may spend too much money on such provisions where they are not actually cost-justifiable.

Can you put a price on what a failure in your organization's data network would cost? Per hour? Per day? If you can't, you're in good company. While some Wall Street firms could probably quote net failure costs in thousands of dollars lost per second, many of the organizations whose networks I've helped design and implement usually could not.

The management of these organizations tends to fall into one of two extremes. At one end is the network manager who, without much regard for actual cost, declares, "We've got to have everything fully redundant and remotely manageable in our network!" At the other end is the network manager who demands a bare bones network design. When I or other staff members recommend that more fault tolerance — which might include building in more bandwidth to accommodate rerouted traffic in case of failure — or network backup be provided, the manager balks at the added expense, citing budget restraints or customer price expectations.

What usually happens? In the first extreme, implementation costs are usually much higher than anticipated, and either the project is delayed while the network manager reaches a budgetary compromise with upper management, or worse, the project is shelved.

In the second extreme, there is eventually a failure in the network that affects a large business opportunity or prevents the chief executive officer from using electronic mail for three days. Out of this embarrassment, some corrective action is taken to prevent a similar failure from occurring in the future. Waiting for failures to occur is a very expensive way to tune a network.

With the results of network failure analysis, net managers can define satisfactory and realistic performance levels, the cost of which can now be justified based on potential loss of business.

For example, take a 20-node router network. It would be reasonable to cluster the more remote nodes to regional hubs, then interconnect the regional hubs. But what if one of the regional hubs had been in the basement of the World Trade Center in New York City? Unless there was some level of fault tolerance or backup designed into the network, such as a degree of meshness interconnecting some of the remote offices or some switched digital backup capability, losing a regional hub could isolate all the remote offices connected to it.

Every network planning group needs to explicitly define terms such as "fault tolerant," "redundant" and "network management" for their particular organization. Acceptable levels of each should be set based on the associated costs and risks. The cost-to-risk ratio may be defined in dollars or, as is usually the case, in some subjective fashion.

This cost-to-risk ratio should also be agreed to by upper management so there is consensus on how much network failure is acceptable based on the costs of alternative, more fault-tolerant designs. Certainly, savvy network engineers can help keep costs down with innovative solutions, but managers who insist that "no failure is acceptable" must be willing to pay and, in many cases, pay handsomely for that luxury.

One of my favorite quotes is, "Organizations don't plan to fail, they simply fail to plan." Not accurately measuring up how network failures will affect your business will cost your organization by causing you to either over-configure the network or allow too many points of failure to exist without contingencies.

Perez is a consultant with RPM Associates, Inc., a network consulting firm in Ellicot City, Md. He can be reached at (301) 846-8084 or via the Internet at mperez@rpm.com.

Letters

On target

I enjoyed David Bernard Ciolkowski's column "Novell: Improve customer support" (Oct. 4, page 46) and heartily agree. From my lowly user's perspective, I seem to be a necessary evil to Novell, Inc. Case in point: I recently purchased NetWare 4.01. After spending tens of thousands of dollars, I was told it did not come on floppy — only compact disc (which I later found out is not true; it just costs more on floppy). So I went and purchased a CD drive.

Since reading the manuals from CD is painfully slow and I don't seem to be as comfortable finding things on a screen using searches as I do using paper, I decided to install the CDROM copies of the manuals on my hard disk, then print them out to my laser printer. I am not a Certified NetWare Engineer, but I do have a fair amount of 3.11 expertise, so I assumed I could follow the manual's instructions. The manual does not help very much, telling me to "Edit your copy of the ET.INI file" without giving much help on what needs to be changed and what it should be changed to.

After spending a couple of frustrated hours, I attempted to obtain technical support, only to be told I would have to pay for it. Imagine, I just spent thousands of dollars and could not even get installation support! Finally I resorted to purchasing a paper set of manuals (at a large extra cost).

I think Novell is falling into the same trap lots of big companies without much competition fall prey to: They tend to lose sight of their customers.

Mark Butler
Parker, Colo.

BBS not the source

The column "Novell: Improve customer support" (Oct. 4, page 46) contains an error that will really fan the flames that the writer, David Bernard Ciolkowski, was raving about.

As a NetWare user (and a Certified NetWare Engineer and a fledgling Certified Novell Instructor), I would love a source for Novell file downloads, patches and fixes other than the NetWire forum on CompuServe. However, the "recent" Novell bulletin board service (BBS) in Monterey *isn't it*. These two numbers have been available for quite some time to call the BBS for the Novell Desktop Systems Group, which, of course, is the old Digital Research, Inc.

There are files available, but they are NetWare Lite, DR DOS, Novell DOS and various "client" support files only. I left electronic mail for the systems operator there today suggesting that they should start making a larger library of Novell downloads available, especially since they will be getting calls from all over the country looking for free access.

A real alternative that should be satisfactory to Ciolkowski and others in his boat is buying access to the Internet through a local service provider. Once you have full access (including Newsgroup and FTP file transfer), obtaining the Novell server in Provo, Utah, for file downloads should be trivial. This is easy for me to say, since I haven't done it, but I've seen it done.

Clark Wood
Technical support specialist
Kaiser Permanente
Walnut Creek, Calif.

Ciolkowski responds: I believe it is very important that computer professionals call Novell on the carpet for neglecting its customers. However, I think you have misunderstood several of my points and misrepresented some facts.

Inclusion of current NetWare driver files on Novell's Monterey BBS indeed began "recently" — in June of this year. It is not a complete selection of files, but it is a start.

Be careful not to understimate the usefulness of the Monterey BBS. Included in the file directory are two files that you toss off as "Various client support files" — DOSUP7.ZIP and WINUP7.ZIP. Without the updated drivers inside these ZIP files, NetWare may not function correctly with Windows. Now users do not have to go through CompuServe or their value-added reseller to get them.

Your "real" alternative is interesting but clearly demonstrates that you have missed the point. Why should any software customer have to go through so much trouble to obtain bug fixes and updates? Novell's behavior toward its customers shows arrogance and disrespect. Customers have given Novell the lion's share of the market and, with it, the ability to control a portion of the industry. Novell has chosen not to handle that gift responsibly. The rest is up to us.

So go on and make those complaints. Complain until you get what

See **Letters**, *page* 52

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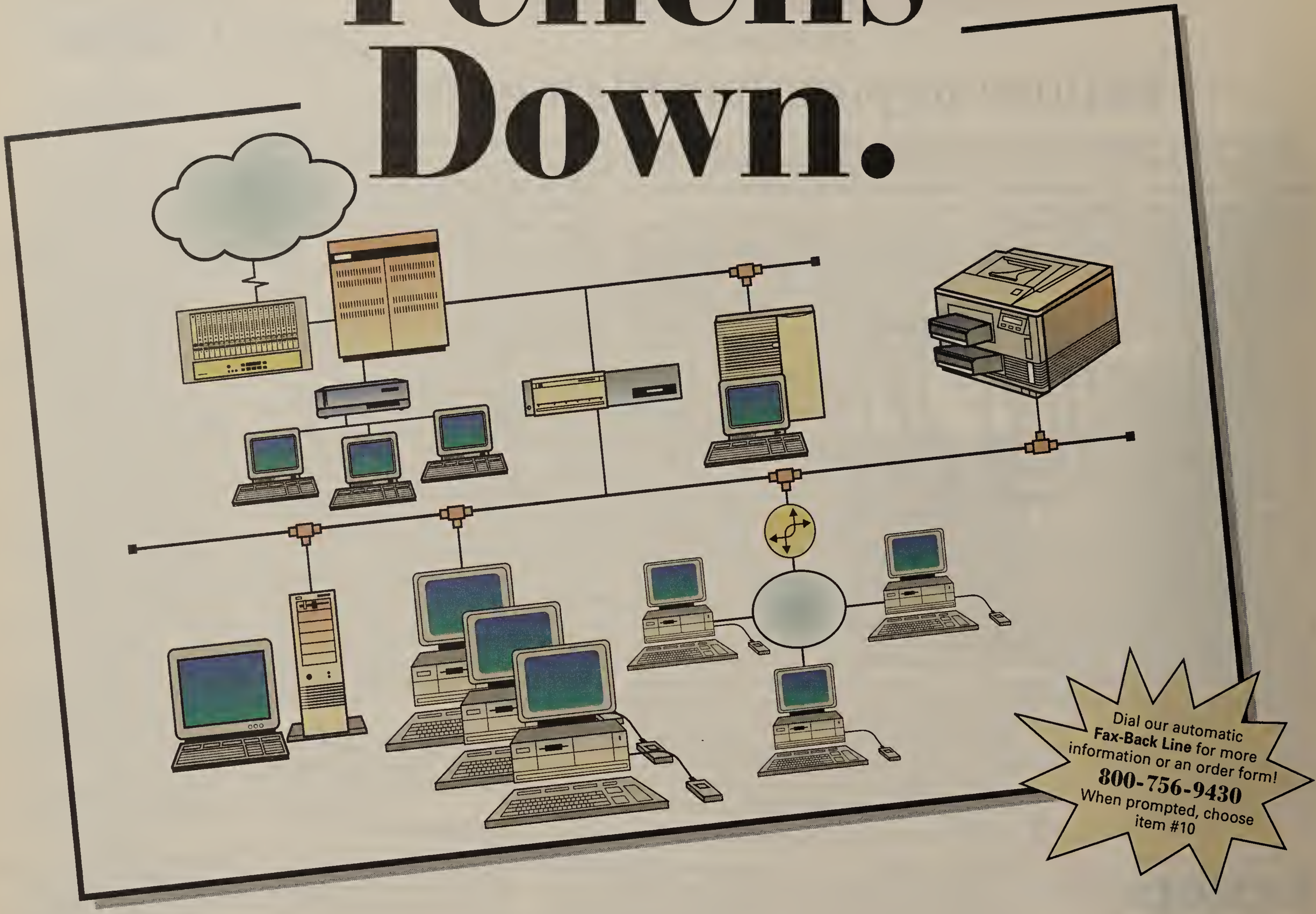

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NETWORK WORLD

REMOTE LAN ACCESS

Buyer's guide

Remotely speaking

Remote LAN access products offer an efficient, cost-effective way for nomadic users to keep in touch with the office LAN.

BY MARK A. MILLER

With computing power tucked under their arms or sitting in their palms, workers of the '90s are always on the go. They're spending less time in front of their LAN-attached PCs in the office. Instead, they're flipping open their laptops and working on the road. Yet they still need access to corporate local-area network resources.

This remote computing trend is cutting across industries. For instance, computer makers such as Hewlett-Packard Co. are feeling the pressure to provide LAN access to remote users. HP has devised a remote LAN access plan that just may revolutionize the way it does business.

Using the NetExtend Remote Network Access Service developed by HP's U.S. Technology Center in Atlanta, the company's mobile sales force, field service and support personnel, and work-at-home employees will have dial-up access to the worldwide HP network via an 800 number.

"HP's network infrastructure was not originally designed to support extensive remote access applications," says Paul Kreider, research and development consultant at HP in Atlanta. "With today's changing business environment, we needed a solution that would address the mobility that today's marketplace demands."

HP's service is scheduled to go on-line early next year and will be available to all employees. After registering in the company's security database, employees are given an 800 number to call and software that will enable them to access a Centrum Communications, Inc. CentrumRemote server in Atlanta.

Using personal computers or Unix-based workstations, employees can dial in to the CentrumRemote server any time of the day or night. Once they pass a security validation process on a LeeMah DataCom Security Corp. TraqNet, users are connected to the CentrumRemote server, through which the employee can access the Atlanta LAN and, from there, any other host or server on HP's worldwide Transmission Control Protocol/Internet Protocol-based network.

"Remote access benefits both the company and the employee," Kreider says. "The company performs its civic duty by reducing traffic congestion and air pollution while enjoying the cost benefits of reduced office space and parking requirements. Employees can use their time more efficiently, increase their scheduling flexibility, and decrease commuting time and cost. In short, everyone wins."

HP is not the only company finding that doing business in the 1990s requires adoption of new communications methods.

The Short List

Dial-up bridge/routers

- ✓ Combinet, Inc.'s Everyware series
- ✓ Rockwell International Corp.'s Nethopper series

Remote access servers

- ✓ Centrum Communications, Inc.'s CentrumRemote
- ✓ Citrix Systems, Inc.'s WinView for Networks
- ✓ Digital Communications Associates, Inc.'s Remote LAN Node 2.0
- ✓ Shiva Corp.'s LanRover series
- ✓ Telebit Corp.'s Netblazer series

Remote control software

- ✓ Microcom, Inc.'s Carbon Copy for Windows 2.0
- ✓ Norton-Lambert Corp.'s Close-Up 5.0

Complete details about The Short List appear on page 46.

"Companies are focused on lowering their overhead to become more competitive," says Michael Feinstein, director of marketing for Shiva Corp. in Burlington, Mass. "For example, upper management wants its sales force out on the street with customers, not in the office dictating letters. But that works only as long as the sales force can communicate with headquarters — and remote LAN access products are the solution to that challenge."

The remote LAN access market is seen by many analysts to be the next major networking frontier. Kitty Weldon, data communications analyst at The Yankee Group in Boston, has identified four categories of users that can benefit from remote LAN access products: remote branch offices, telecommuters, nomadic users and business travelers (see graphic, page 48).

OPTIONS ABOUND

Remote networkers have several options for remote LAN access. Remote access servers, dial-up bridges and routers, and remote control software make remote connectivity to the office — and its vital information — possible and affordable.

Remote access servers and dial-up bridge/routers are at the high end of the market. Remote access servers reside at headquarters and enable remote users to become fully functioning nodes on the headquarters LAN and typically have multiple wide-area ports. Remote nodes must run client software that works with the remote access server via a modem or data service unit/channel service unit (DSU/CSU). Vendors in this category include Centrum, Citrix Systems, Inc., Digital Communications Associates, Inc., Novell, Inc., Shiva and Telebit Corp.

Remote dial-up bridge/routers establish a dial-up link with a similar dial-up bridge/router at the central site, enabling multiple PCs attached to a remote work group LAN to appear as though they are attached to the centralized LAN. These products establish dial-up links over analog, switched digital 56K bit/sec or Integrated Services Digital Network Basic Rate Interface (BRI) circuits.

What remote LAN access products should support:

- *Target remote user platforms, such as PC, Macintosh or Unix workstations*
- *Appropriate LAN interfaces, such as Ethernet, token-ring or FDDI*
- *The right internetwork protocol, such as AppleTalk, IP or IPX*
- *Wide-area interfaces supporting asynchronous, synchronous or X.25 data*
- *Dial-back security and remote user authentication*
- *Network management*

A dial-up bridge/router alternative is optimum for small work groups that need to access another LAN on a part-time basis and cannot economically justify a full-time leased-line connection. Vendors supplying dial-up bridge/routers include Cisco Systems, Inc., Combinet, Inc., DigiBoard and Rockwell International Corp.

At the low end of the market are remote control software packages, which enable a remote workstation to dial up and take control of a workstation on the headquarters LAN. Application processing occurs on the headquarters workstation, with only keyboard strokes and screen updates passed over the communications link. This alternative is economically

Continued on page 48

Remote LAN access products

Company	Product	Type	Architecture	Platform	LAN ports	LAN interfaces	LAN support					WAN ports	WAN max. port rate	WAN interfaces	Features						Protocols routed						Terminal emulation	Mgmt.	Price/ Warranty (months)
		DBR = Dial-up bridge/router RAS = Remote access server RCS = Remote control software	F = Freestanding R = Rack-mountable S = Software-based	D = DOS N = NetWare W = Windows M = Macintosh U = Unix O = Other		E = Ethernet T = Token ring F = FDDI O = Other	AppleTalk	VINES	LAN Manager	LAN Server	NetWare		(Bit/sec)	A = Analog D = Digital dial-up I = ISDN	Simultaneous sessions	Compression ratio	Error detection	Inverse multiplexing	Data encryption	Bridging	AppleTalk	DECnet	TCP/IP	IPX	SNA	VINES	3 = 3270 L = LAT 5 = 5250 T = Telnet	S = SNMP T = Telnet	
Artisoft, Inc. (800) 233-5546	Central Station II	RAS	F	D, N, O	1	E					✔		NA	NA			CRC												$595/60
Baseline Software (800) 829-9955	Password Coach	RCS	S	D, N, W	(1)	NA					✔	NA	NA	NA	(2)			✔	✔										Server: $395; source license: $10,000/1
	Password Genie	RCS	S	D, N, W	(1)	NA					✔	NA	NA	NA	(2)			✔	✔										Server: $395; source license: $10,000/1
Cayman Systems, Inc. (617) 494-1999	GatorLink	RAS	F, R	M	1	E	✔					3	56K	A	3	2.5:1	MNP		✔								T		$1,445-$1,495/ 24
Centrum Communications, Inc. (408) 894-1800	CentrumRemote	RAS	F, R		1	E	✔	✔	✔	✔	✔	16	57.6K	A, D	16	4:1	MNP, proprietary	✔		✔	✔	✔	✔	✔	✔	✔		S	$3,495-$6,295/ 12
Cisco Systems, Inc. (415) 326-1941	Cisco ASM-CS	DBR	F		1	E, T	✔		✔		✔	113	57.6K	A, D	112		V.42bis, MNP	✔					✔	✔			3, L, T	S, T	$10,700-$15,995/ 3
	Cisco 500-CS	DBR	F		1	E	✔		✔		✔	16	38.4K	A	16		V.42bis, MNP	✔					✔	✔			3, L, T	S, T	$3,295-$3,995/ 3
	Cisco 2000	DBR	F		1	E, O, T	✔		✔		✔	1	4K	D, I				✔		✔	✔		✔	✔			T	S	$3,195-$4,195/ 3
	Cisco 4000	DBR	F		1	E, F, O, T	✔	✔	✔		✔	4	4K	D, I				✔		✔	✔	✔	✔	✔		✔	T	S, T	$1,800-$3,600/ 3
	Cisco 3000	DBR	S		2	E, O, T	✔	✔	✔		✔	2	4K	I						✔	✔	✔	✔	✔		✔	T	S, T	$4,295-$6,995/ 3
Citrix Systems, Inc. (800) 437-7503	WinView for Networks	RAS	S	D, N, O, W	2	E, F, T			✔		✔	NA	NA	NA	10-20	2.5:1	SWECP		✔								3, 5, T	T	$2,645-$3,995/ 3
Combinet, Inc. (800) 967-6651	Everyware 150	DBR	F		1	E	✔	✔	✔	✔	✔	1	512K	I	2	4:1	CRC	✔		✔									$990/12
	Everyware 200	DBR	F		1	E	✔	✔	✔	✔	✔	1	512K	I	2	4:1	CRC	✔		✔									$2,190/12
	Everyware 400	DBR	F		1	E	✔	✔	✔	✔	✔	1	512K	I	2	4:1	CRC	✔		✔									$2,190/12
	Everyware 600	DBR	F		1	E	✔	✔	✔	✔	✔	2	224K	D	2	4:1	CRC	✔		✔									$2,490/12
Cubix Corp. (800) 829-0550	Enhanced Resource Subsystem	RAS	F, R	D, M, N, U	(1)	E, F, O, T	✔	✔	✔	✔	✔	1,000	115.2K	A, D, I	1,000	Varies	Varies	✔	✔	✔	✔	✔	✔	✔	✔		3, 5, L, T	S	Starts at $2,315/12
	QL Series Communication Controller	RAS	F, R		(1)	E, F, T	✔				✔	1,000	115.2K	A, D, I	1,000	Varies	Varies	✔	✔	✔	✔			✔	✔		3, 5, T	S	$995-$5,895/ 12
DigiBoard (800) 344-4273	IMAC	DBR	F		1	E						1	128K	I	8		NOS-dependent	✔		✔								S	$1,695/60
	Dual IMAC	DBR	F		1	E						2	128K	I	16		NOS-dependent	✔		✔								S	$2,795/60
	PC IMAC	DBR	S	N, W	1	E					✔	1	128K	I	8		NOS-dependent	✔					✔					S	$995/60
	PC IMAC/4	DBR	S	N	1	E					✔	4	128K	I	32		NOS-dependent	✔					✔					S	$1,195-$3,980/ 60
Digital Communications Associates, Inc. (800) 348-3221	Remote LAN Node 2.0	RAS, RCS	S	D, M, N, W	1	E, T		✔	✔	✔	✔	16	115K	A, D, I	16	4:1	V.42, Network Protocol Layer		✔	✔							3, 5, L, T	S	$795-$6,850/ 12
	Remote LAN Node Server	RAS, RCS	R	D	1	E, T		✔	✔	✔	✔	16	115K	A, D, I	16	4:1	V.42, Network Protocol Layer		✔	✔							3, 5, L, T	S	$3,845-$8,445/ 12
Gateway Communications, Inc. (800) 367-6555	LAN Expander	RAS, RCS	F	N	1	E					✔	NA	57.6K	A	1														$795/12
	LAN Access Server	RAS, RCS	F	N	1	E					✔	NA	57.6K	A	1														$1,795-$1,995/ 12
IBM (914) 642-4032	IBM Dial-in LAN Server for Token Ring	RAS, RCS	R	D, N, O	1	T			✔	✔	✔	8	56K	A	8												3, 5, T	S, T	$4,200/12
	IBM Dial-in LAN Server for Ethernet	RAS, RCS	R	D, N, O	1	E			✔	✔	✔	8	56K	A	8												3, 5, T	S, T	$3,255/12
J&L Information Systems, Inc. (818) 709-1778	ChatterBox NRS	RAS, RCS	R	D, N	(1)	E, T	✔	✔	✔		✔	NA		NA	50		Done via attached modem		✔	✔		✔	✔	✔	✔	✔	3, 5	S	$3,095/12
	ChatterBox Plus	RAS, RCS	F	D, N	10	E, T	✔	✔	✔		✔	NA	115K	NA	10		Done via attached modem		✔	✔		✔	✔	✔	✔	✔	3, 5	S	$3,595/12
LeeMah DataCom Security Corp. (800) 331-2734	TraqNet/InfoKey	RAS	R		128	E, F, O, T						128	NA	A	128			✔				✔	✔		✔				$950-$4,590/ 24
	MultiTraq/ InfoCard	RAS	R		152	NA						152	38.4K	D	152			✔											$5,900-$8,500/ 24
	FasTraq	RAS	F		1	NA						1	57.6K	NA	1	4:1	MNP	✔											$895/24
Microcom, Inc. (800) 822-8224	Carbon Copy for Windows 2.0	RCS	S	D		NA			✔		✔	NA		NA	1	2:1	Proprietary		✔										$199/1
Microdyne Corp. (800) 255-3976	Asynchronous Communication Server	RAS, RCS	S	N	1	E, T	✔				✔	8	38.4K	A	8	4:1	V.42, MNP											S, T	$1,000-$12,000/12
	NetWare Application Server	RAS, RCS	S	D	1	E, T	✔				✔	8		A	8	4:1	V.42, MNP										3, 5, T	T	$4,000-$12,000/12
Motorola UDS (800) 451-2369	BitRUNR XP	RAS	F		3	E, T	✔				✔	21	128K	A, D, I,	19	8:1	V.42	✔	✔		✔		✔	✔			T	S, T	$2,495-$5,695/ 24

Remote LAN access products

Company	Product	Type	Architecture	Platform	LAN ports	LAN interfaces	LAN support					WAN ports	WAN max. port rate	WAN interfaces	Features						Protocols routed						Terminal emulation	Mgmt.	Price/ Warranty (months)
		DBR = Dial-up bridge/router RAS = Remote access server RCS = Remote control software	F = Freestanding R = Rack-mountable S = Software-based	D = DOS N = NetWare W = Windows M = Macintosh U = Unix O = Other		E = Ethernet T = Token ring F = FDDI O = Other	AppleTalk	VINES	LAN Manager	LAN Server	NetWare		(Bit/sec)	A = Analog D = Digital dial-up I = ISDN	Simultaneous sessions	Compression ratio	Error detection	Inverse multiplexing	Data encryption	Bridging	AppleTalk	DECnet	TCP/IP	IPX	SNA	VINES	3 = 3270 L = LAT 5 = 5250 T = Telnet	S = SNMP T = Telnet	
	BitRUNR Turbo CS	RAS	R		3	E, T	✓				✓	6	128K	A, D, I	26	8:1	V.42	✓	✓		✓		✓	✓			T	S, T	$4,995-$10,995/ 24
	LanFast	RAS	F		1	E, T					✓	2	57.6K	A	2	4:1	V.42		✓					✓					$1,995-$2,495/ 24
Multi-Tech Systems, Inc. (800) 328-9717	MultiExpress	RCS	S	D, N	1	NA		✓	✓	✓	✓		115K	NA	1	4:1	V.42, FTP-dependent												$199-$349/24
	MultiModem LAN	RAS, RCS	F	D, N	2	E					✓	2	57.6K	A	2	4:1	V.42			✓									$1,999-$2,149/ 60
	MultiCom Async Gateway 2	RAS, RCS	F	D, N	32	E, F, O, T		✓	✓	✓	✓	32	57.6K	A	32	4:1	V.42, FTP-dependent												$2,099-$3,999/ 60
	MultiArray II	RAS, RCS	F	D, N	32	E, F, O, T		✓	✓	✓	✓	32	57.6K	A	32	4:1	V.42, FTP-dependent												$3,599-$9,999/ 60
	MiniArray	RAS, RCS	F	D, N	16	E, F, O, T		✓	✓	✓	✓	16	57.6K	A	16	4:1	V.42, FTP-dependent												$3,499-$3,599/ 60
	MultiCom Async Gateway TSR	RAS, RCS	F	D, N	2	E, F, O, T		✓	✓	✓	✓	2	57.6K	A	2	4:1	V.42, FTP-dependent												$349/24
Network Automation (508) 393-1777	Work Station Interface Node	RAS	S	N, U	(1)	E, F, O, T	✓		✓		✓		16K	A,D, I	(2)		Packet switching		✓	✓	✓	✓	✓	✓	✓		3, 5, L, T	S	$2,000-$4,000/ 12
Newport Systems Solutions, Inc. (714) 752-1511	LAN2PC	RCS	S	D, N, W	NA	NA					✓	1	2.048M	A,D, I	1	4:1	HDLC, LAP B										T		$1,295-$2,095/ 24
	PC2LAN/X.25	RCS	S	D, W	NA	O					✓	1	38.4K	A	2		HDLC, LAP B							✓					$149/24
Norton-Lambert Corp. (805) 964-6767	Close-Up 5.0	RCS	S	D	NA	E, F, T		✓	✓	✓	✓	NA	115.2K	NA	1	4:1	Proprietary		✓								3, 5		$199/3
	Close-Up/ LAN 2.5	RCS	S	D	1	E, F, T		✓	✓		✓	NA		A, D, I			Proprietary										3, 5		$395-$1,995/3
Novell, Inc. (800) 638-9273	NetWare Connect 1.0	RAS	S	N	64	O	✓				✓	NA	115.2K	I	64	4:1	V.32		✓		✓		✓	✓				S	$595-$5,995/3
Ocean Isle Software, Inc. (800) 677-6232	Reach Out Total Remote	RAS, RCS	S	D, W	32	E, T		✓	✓		✓	NA		NA	32		Proprietary		✓	✓									$249/24
OST, Inc. (703) 817-0400	Lan X Pand	RCS	S	D	1	E					✓	10	64K	A, D, I	12		HDLC							✓					$150-$995/12
	MacSnet Link	RCS	S	M	1	O	✓					8	64K	I	8	4:1	HDLC	✓			✓								$500/12
Penril Datability Networks, Inc. (800) 473-6745	BRX 2500 Mux/router	RAS	F, R		1	E						8	57.6K	A, I	8												L, T	S, T	$2,999/12
RAD Data Communications, Inc. (201) 529-1100	TRE-PC/LAN Ranger Series	RAS, RCS	R	D, N, O, U	1	T		✓	✓	✓	✓	1	57.6K	A, D, I	1		HDLC		✓	✓								S	$180-$1,450/ 12
Rockwell International Corp. (800) 262-8023	Nethopper NH-P	DBR	F		1	E						1	57.6K	A	(3)	4:1	V.42bis						✓				T	S, T	$1,695/12
	Nethopper NH-3	DBR	F		1	E						3	57.6K	A	(3)	4:1	V.42bis						✓				T	S, T	$3,495/12
Shiva Corp. (617) 864-8500	LanRover/L	RAS	F		1	O	✓					1	57.6K	A, D, I	1	4:1	ARAP										3, 5, T		$699/ Software: 3; hardware: 12
	NetModem/E	RAS	F		1	E	✓		✓	✓	✓	1	57.6K	A	1	4:1	V.42				✓			✓			3, 5, T	S	$1,699/ Software: 3; hardware: 12
	LanRover/E for AppleTalk Remote Access	RAS	R		1	E	✓					8	64K	A, D, I	8	4:1	ARAP										3, 5, T	S	$2,499-$3,499/ Software: 3; hardware: 12
	LanRover/E for NetWare	RAS	R	N	1	E					✓	8	64K	A, D, I	8												3, 5, T	S, T	$2,499-$3,499/ Software: 3; hardware: 12
	LanRover/T for NetWare	RAS	R		1	T						8	64K	A, D	8	4:1	V.42										3, 5, T	S	$2,799-$3,899/ Software: 3; hardware: 12
Stampede Technologies, Inc. (800) 763-3423	Remote Office	RAS	S	D, N	32	E		✓	✓		✓	NA	NA	NA	32	4:1	FCS		✓				✓					S	$395-$9,499/ Software: 3; hardware: 60
Symantec Corp. (800) 441-7234	Norton PC Anywhere 1.0 for Windows	RCS	S	D	NA	E, T		✓	✓	✓	✓	1	115.2K	A	1		Proprietary												$199/2
	Norton PC Anywhere 4.5	RCS	S	D	NA	E, T		✓	✓	✓	✓	1	115.2K	A	1		Proprietary												$179/2
Telebit Corp. (800) 835-3248	Netblazer ST	RAS	F	O	2	E, T	✓				✓	22 (4)	115K (5); 1.544M (6)	A, D, I	18	4:1	V.42, MNP	✓			✓		✓	✓			T	S, T	$2,599-$5,000/ Software: 3; hardware: 12
	Netblazer 40	RAS	F	O	3	E, T	✓				✓	36 (7)	115K (5); 1.544M (6)	A, D, I	26	4:1	V.42, MNP	✓			✓		✓	✓			T	S, T	$4,599-$10,000/ Software: 3; hardware: 12
	Netblazer PN	RAS	F	O	1	E	✓				✓	3 (8)	115K (5); 128M (6)	A, D, I	2	4:1	V.42, MNP	✓			✓		✓				T	S, T	$2,299-$2,699/ Software: 3; hardware: 12

Products highlighted by color were selected for The Short List.

FOOTNOTES:

(1) Number of LAN ports depends on LAN configuration.
(2) Number of simultaneous sessions supported depends on NOS used.
(3) Limited only by WAN bandwidth.
(4) 18 asynchronous ports plus 4 synchronous ports (1 T-1 max.).
(5) Asynchronous traffic.
(6) Synchronous traffic.
(7) 26 asynchronous ports plus 10 synchronous ports (3 T-1 max.).
(8) 2 asynchronous ports, or 1 asynchronous plus 1 synchronous port.

ARAP = AppleTalk Remote Access Protocol
CRC = Cyclic Redundancy Check
FCS = Frame Check Sequence
FTP = File Transfer Protocol
LAP B = Link Access Procedure B
LAT = Local Area Transport
MNP = Microcom Network Protocol
NA = Not applicable
SWECP = Sliding Window Error Correction Protocol

SOURCE: DIGINET CORP., BROOMFIELD, COLO.

Remote LAN access products

Company	Product	Type	Architecture	Platform	LAN ports	LAN interfaces	LAN support					WAN ports	WAN max. port rate	WAN interfaces	Features						Protocols routed						Terminal emulation	Mgmt.	Price/ Warranty (months)
		DBR = Dial-up bridge/router RAS = Remote access server RCS = Remote control software	F = Freestanding R = Rack-mountable S = Software-based	D = DOS M = Macintosh N = NetWare U = Unix W = Windows O = Other		E = Ethernet F = FDDI T = Token ring O = Other	AppleTalk	VINES	LAN Manager	LAN Server	NetWare		(Bit/sec)	A = Analog D = Digital dial-up I = ISDN	Simultaneous sessions	Compression ratio	Error detection	Inverse multiplexing	Data encryption	Bridging	AppleTalk	DECnet	TCP/IP	IPX	SNA	VINES	3 = 3270 5 = 5250 L = LAT T = Telnet	S = SNMP T = Telnet	
Trio Information Systems, Inc. (800) 880-4400	Trio Remote Disk/Lan	RAS, RCS	S	D, N, O, W	64	NA		✔	✔	✔	✔	NA	58.7K	A	64	2.5:1	V.42bis, MNP, CRC												$195-$1,895/ 12
Triton Technologies, Inc. (800) 322-9440	CoSession	RCS	S	D, N, W	1	NA		✔	✔	✔	✔	NA	115.2K	A, D, I	1	Varies	SWECP		✔										$125-$179/3
U.S. Robotics, Inc. (800) 342-5877	Shared Access Communication Server 386/e + TR	RAS, RCS	F	D	1	T					✔	NA	57.6K	A	1	4:1	V.42, MNP							✔					$2,495/24
	Shared Access Communication Server 386/e	RAS, RCS	F	D	1	E					✔	1	57.6K	A	1	4:1	V.42, MNP							✔					$1,995/24
	Shared Access LAN Modem/e	RAS, RCS	F	D	2	E					✔	2	57.6K	A	2	4:1	V.42, MNP							✔					$1,695/24
	Shared Access LAN Modem/TR	RAS, RCS	F	D	2	T					✔	2	57.6K	A	2	4:1	V.42, MNP							✔					$2,195/24
	Shared Access Modem Sharing Kit	RAS, RCS	S	D	2	E, F, O, T			✔	✔	✔	2	57.6K	A	2	4:1	V.42, MNP												$795-$1,395/ 60
Xinetron, Inc. (800) 345-4415	Fastrack	RCS	S	D	1	E, F, O, T		✔	✔	✔	✔	NA	38.4K	A	1														$79/3
	Win Access Server	RAS	F	D, N, O	16	E, F, T				✔	✔	NA	38.4K	A	16				✔	✔			✔				T	T	$7,000- $18,000/ 36
Xircom, Inc. (800) 438-4526	Xircom Pocket Ethernet Modem	RAS	S	D, N, W	1	E		✔	✔		✔	1	14.4K	A	1	4:1	V.42, MNP												$699/24
Xylogics, Inc. (800) 892-6639	Annex PCS	RAS	F	U	8	E						NA	57.6K	NA	8				✔				✔				3, L, T	S, T	$2,695-$3,600/ 60
	Annex Three	RAS	F, R	U	64	E						NA	57.6K	NA	64				✔				✔				3, L, T	S, T	$4,295-$7,995/ 60
	MicroAnnex XL	RAS	F	U	16	E						NA	57.6K	NA	16				✔				✔				3, L, T	S, T	$2,195-$3,600/ 60
	Annex LANmodem	RAS, RCS	F	N	2	E, T					✔	NA	57.6K	A	2	4:1	V.42, MNP		✔					✔					$1,995-$2,595/ 12
	MicroAnnex NCS	RAS, RCS	F	N	2	E					✔	2	57.6K	NA	2				✔					✔					$1,195/12

Products highlighted by color were selected for The Short List.

FOOTNOTES:
(1) Number of LAN ports depends on LAN configuration.
(2) Number of simultaneous sessions supported depends on NOS used.
(3) Limited only by WAN bandwidth.
(4) 18 asynchronous ports plus 4 synchronous ports (1 T-1 max.).
(5) Asynchronous traffic.
(6) Synchronous traffic.
(7) 26 asynchronous ports plus 10 synchronous ports (3 T-1 max.).
(8) 2 asynchronous ports, or 1 asynchronous plus 1 synchronous port.

ARAP = AppleTalk Remote Access Protocol
CRC = Cyclic Redundancy Check
FCS = Frame Check Sequence
FTP = File Transfer Protocol
LAP B = Link Access Procedure B
LAT = Local Area Transport
MNP = Microcom Network Protocol
NA = Not applicable
SWECP = Sliding Window Error Correction Protocol

SOURCE: DIGINET CORP., BROOMFIELD, COLO.

The Short List:

Remote LAN access

The Short List highlights products Network World *recommends you examine during the purchasing process for remote LAN access offerings. Products included in The Short List meet the buying criteria outlined here and, in some cases, offer additional useful features. Your criteria may differ based on network configuration and application needs.*

Dial-up bridge/routers

■ **Combinet, Inc.'s Everyware series.** These products provide bridging to link a remote client or entire work group to a headquarters Ethernet LAN via ISDN at up to 128K bit/sec. ISDN calls are established using a single 64K bit/sec ISDN B channel. A second B channel can be added when the amount of data to be transmitted exceeds a user-defined threshold and dropped when it is no longer needed.

■ **Rockwell International Corp.'s Nethopper series.** These dial-up routers are quick and easy to install, taking about five to 10 minutes. They include an internal V.42bis modem and currently route TCP/IP, with NetWare support available in November.

Remote access servers

■ **Centrum Communications, Inc.'s CentrumRemote.** This product has a very comprehensive feature set, such as support for as many as 16 ports, and a broad range of networks, including AppleTalk, VINES, DECnet, LAN Manager, NetWare and TCP/IP. Support for a mix of network adapter board drivers enable remote users to have multiple sessions employing multiple protocols during a single Windows session.

■ **Citrix Systems, Inc.'s WinView for Networks.** This product works well in Windows environments. Citrix licensed Windows 3.1 from Microsoft Corp. to develop this pacakge. Working in NetWare and LAN Manager environments, the OS/2-based multitasking server software executes Windows applications using commands entered on the remote client and sends only screen updates to that client.

■ **Digital Communications Associates, Inc.'s Remote LAN Node 2.0.** The product's strength lies in its modular, protocol-independent approach to remote LAN access. Intelligent multiport adapter boards plug into a user-provided Intel Corp. 80286-based or higher PC. The product's server software supports as many as 16 remote clients as well as bridging, making it protocol-independent. Security is provided via a hardware key attached to a client's serial or parallel port that contains a unique LAN address that must be registered with the server.

■ **Shiva Corp.'s LanRover series.** Each model supports different network interfaces and protocols, making Shiva strong in providing specialized features for niche applications. For example, an AppleTalk version supports LocalTalk or Ethernet. In NetWare environments, access may be controlled using either Shiva's proprietary security options, which include dial-back, or through security information in the NetWare Bindery. The TCP/IP version supports the Serial Line Internet Protocol and the Point-to-Point Protocol (PPP).

■ **Telebit Corp.'s Netblazer series.** The series supports strong security and management options. Security options include user ID/password, callback and a cryptographic handshake procedure based on the Data Encryption Standard. For Novell networks, security information in the NetWare Bindery may be utilized. For additional security, Netblazer supports the Kerberos user authentication scheme. Netblazer can be managed by SNMP-based workstations using a Telebit-developed private Management Information Base.

Remote control software

■ **Microcom, Inc.'s Carbon Copy for Windows 2.0.** This package includes a clipboard that enables remote PCs to cut data from an application running on a headquarters PC and paste it into an application on a remote PC. It also has a Roving Callback security feature that enables headquarters PCs to dial back the number from which a user is calling, instead of a predefined number.

■ **Norton-Lambert Corp.'s Close-Up 5.0.** This package includes video compression and a Photographic Memory feature that makes sure only those portions of a Windows screen that actually change are transmitted from the headquarters PC to the remote PC.

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NW1

Continued from page 43

attractive, generally costing no more than $200 to $300 per client, but it suffers in performance with some applications, such as Windows or graphics-intensive programs.

Microcom, Inc., Multi-Tech Systems, Inc., Norton-Lambert Corp., Ocean Isle Software, Inc., Symantec Corp. and Triton Technologies, Inc. make remote control software.

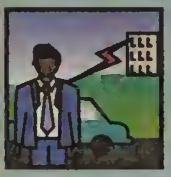
FOUR MAIN CRITERIA

Regardless of the type of remote LAN access product under consideration, network managers should consider four key selection criteria: connectivity requirements, integration with existing network standards, security and network management. How these are prioritized depends on who's calling the shots — the end user or the network manager.

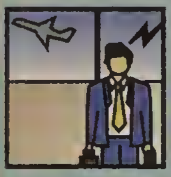
Who's calling for remote LAN access

Remote branch office workers
- Spend most of time at a small branch office.
- Typically access headquarters LAN 40 hours per month.
- Have diverse mix of applications, including transaction processing and database access.
- Will be focus of value-added network provider remote LAN access transport services that will compete with hardware vendors for a share of this mushrooming market.

Telecommuters
- Work at home employees that represent the fastest growing user segment.
- Typically access headquarters LAN 20 to 30 hours per month.
- Utilize graphic-intensive applications, such as Windows, that require a product to provide adequate bandwidth and response time.



Nomadic users
- Sales and service personnel who are on the road most of the time.
- Typically access headquarters LAN 8 to 10 hours per month.
- Applications include checking for sales leads and site of next service call.



Business travelers
- Executives and others that frequently travel.
- Typically access headquarters LAN 1 to 5 hours per month.
- Applications include checking E-mail and file transfers.

GRAPHIC BY SUSAN SLATER

SOURCE: THE YANKEE GROUP, BOSTON

"If you talk to the people sitting next to you on airplanes as users, their remote access requirements are somewhat similar to yours," says David Helfrich, vice president of marketing for Centrum Communications in San Jose, Calif. End users want to dial in to the centralized LAN from their preferred platform, whether it is a DOS-based PC, an Apple Computer, Inc. Macintosh or a Unix-based workstation.

To meet user needs for seamless integration between remote PCs and centralized LANs, network managers must consider the topology of the headquarters LAN, such as Ethernet or token ring, as well as the network operating system (NOS) to be accessed, such as Novell's NetWare, Banyan Systems, Inc.'s VINES or Microsoft Corp.'s LAN Manager. The net manager must also consider whether a remote LAN access product will support such internetworking transport protocols as TCP/IP or AppleTalk.

When the connectivity and integration requirements for remote access are defined, they begin to look surprisingly similar to an initial internetwork design — with the exception that the end users could be anywhere in the world, not just at their desks.

Net managers have different requirements, however, with security among the most important. Mechanisms must be designed to ensure that the integrity of the network is preserved once it's opened to remote access.

Network management can be just as important. Network managers will want remote LAN access products that can easily be integrated with existing management systems. Most remote LAN access vendors support the Simple Network Management Protocol as a multivendor solution in this area.

Each type of remote LAN access product is designed differently to meet end-user and network management requirements.

Remote access servers are intended for client/server applications. Application processing occurs on the remote client workstation, and the server at headquarters transfers requested data to the client. For these products to operate efficiently, it is important that the application program reside on the remote client, not on the server.

For example, you don't want to send the executable file for a spreadsheet application from headquarters to a notebook computer hooked up via a pay phone. You would end up making a career out of standing in that phone booth. Instead, you want the spreadsheet application on the remote node to access data files on the centralized server.

A good way to think about remote access servers is that they extend the centralized LAN's backbone cable to other sites, effectively making an Ethernet stretch across the country. Client software running in the remote node emulates a network interface card, making it possible for the remote node to appear as if it was directly attached to the LAN.

> **"A match between the customer application and the product is essential for cost-effective remote access," says Patrick Wong, product marketing manager at Combinet in Sunnyvale, Calif.**

In some cases, remote access servers may function as if they were in a bridged or routed environment. Remote access servers operating as if they were in a bridged network, such as DCA's Remote LAN Node 2.0 and Remote LAN Node Server or Combinet's Everyware series, are independent of network layer protocols . They just pass traffic over the remote link at the data link layer, the second layer of the Open Systems Interconnection's seven-layer model.

If the product operates as if it was a router, such as any one of the products in Shiva's LanRover series or Telebit's Netblazer series, it will work with network layer protocols, the third layer of the OSI model. Certain remote access servers, such as Centrum's CentrumRemote, include both functions, allowing them to route protocols it understands and bridge all others.

The choice of a bridge-, router- or bridge/router-based remote access server depends on the design and topology of the LAN. The same selection process used to determine if a bridge or router will do the job in an internetwork environment applies here. (See *Network World's* bridge and router Buyer's Guides, Aug. 30 and Sept. 27, respectively.)

SATISFYING THE DEMAND

Similar to remote access servers yet different are the emerging class of dial-up bridge/router products hitting the market. Dial-up bridge/routers are intended for client-to-LAN or LAN-to-LAN applications that do not justify a leased-line connection. Products from such firms as Rockwell are designed for analog dial-up connections, while products from such companies as Cisco include interfaces that support high-speed switched digital services, and products from such companies as DigiBoard and Combinet support ISDN links.

For example, Combinet's BRI-based products provide users with one or two 64K bit/sec B channels of bandwidth as necessary. Since the products are transparent bridges, they have an internal table containing the hardware addresses of all nodes detected on the network.

If a remote NetWare client needs to access a server resident on a distant LAN, Combinet's product recognizes that the destination address is remote, sets up the call on the ISDN D channel, provides the NetWare client with the required bandwidth on one or two B channels, then terminates the call using the D channel. The call setup and termination time is in milliseconds, so the entire process is transparent to the end user — just as if it had been done on the LAN.

Remote control software products are less functional. They are designed for client-to-client applications. In effect, they extend the keyboard and display of the headquarters workstation over the communications link to a remote location. Application processing occurs at headquarters, with keystrokes and screen updates sent to the remote user. While these products are the lowest in cost, they also have the least amount of power and may be too slow for graphics-intensive applications.

For remote data entry or transferring small files, however, these solutions may be ideal.

"A match between the customer application and the product is essential for cost-effective remote access," says Patrick Wong, product marketing manager at Combinet in Sunnyvale, Calif.

He recommends modem-based solutions for smaller applications such as electronic mail. Applications that require large intermittent volumes of bandwidth, such as presentation graphics, desktop publishing, medical imaging or computer-aided design and manufacturing programs, are more suited to on-demand solutions.

"Digital WAN technologies can also benefit the end user, with lower error rates and faster call setup times," Wong says.

DECISION FACTORS

The type of remote LAN access product that is selected will obviously depend on the application.

For Patrick Rowe, network manager at JCPenney Catalog Telemarketing, Inc. in Brookfield, Wis., hardware cost became the primary factor when designing the company's remote access architecture. Rowe's network ties 14 telemarketing locations into the Brookfield network operations center. Every half hour, the remote locations upload automatic call distributor reports to the operations center LAN, which then calculates network performance statistics.

"One alternative was to put a remote bridge or router in each location and tie it into the operations center with either dial-up or leased lines," Rowe says. "That would have cost us 15 boxes — 14 in the remote locations and one here at the center."

Instead, he selected Centrum's Centrum-

Calling LON distance

With an increasing number of mobile workers roaming around the countryside requiring dial-up access to local-area network resources, network managers are faced with learning yet another new term — the LAN outer network (LON).

According to Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., LON describes the outer layer of a three-ring LAN architecture.

The first layer represents a standalone LAN, while the second layer represents a series of interconnected LANs that form what Forrester terms a LAN internetwork (LIN).

"Many network users, such as mobile or remote workers, have become disenfranchised from the central network and need access to critical corporate information," Hyland says.

Thus, she sees the LON layer developing in three stages.

The first stage covers the roll of products that enable remote users to access and control the operation of a remote personal computer. With the next stage come products that enable remote users to access and operate a centralized single-application server, such as an electronic mail server.

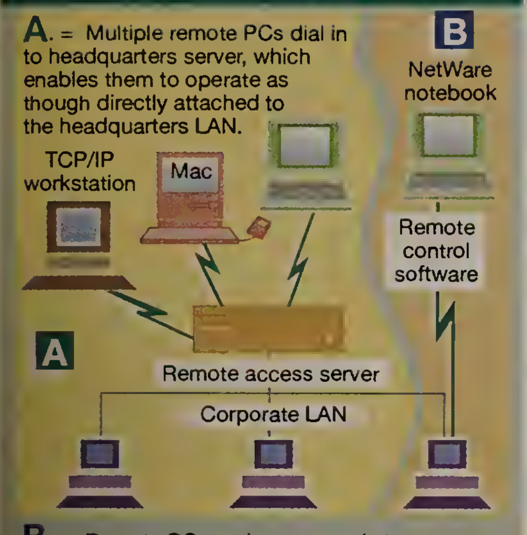
The third stage, which Hyland calls the client/server LON, will enable remote users to dial into a centralized LAN and gain full access to all corporate applications. "Initially, most LON clients will access the server with analog dial-up modems," she says. "By 1996, high-speed switched digital and cellular services will be a widely used transport."

Forrester predicts that many users will choose to bypass the regional Bell holding companies and utilize wireless access to packet services that extend across local access and transport area boundaries or across the globe.

BY MARK A. MILLER

Remote, coupled with existing PCs and data lines at the remote locations, to keep the project costs under control.

Remote PC-to-LAN access



A. = Multiple remote PCs dial in to headquarters server, which enables them to operate as though directly attached to the headquarters LAN.

B. = Remote PC sends commands to headquarters PC, which does application processing and returns only screen updates.

SOURCE: DIGINET CORP., BROOMFIELD, COLO.
GRAPHIC BY TERRI MITCHELL

Charles Mortley-Wood, an analyst at Imperial Oil, Ltd. in Sarnia, Ontario, uses Shiva's NetModem/E for the administration of remote NetWare LANs. "Our refinery is spread over a large area, and at one time, we had many small LANs in remote control rooms," he says. "With the current staff, it was physically impossible for us to have an on-site administrator in each location."

Instead, Imperial installed NetModem/Es at three of its remote sites so that the network management team would not have to drop everything and run to a remote site just to add another user or check on a stalled print server. Using the NetModem/E, remote sites could access the remote server and make the changes from their office during working hours or even from home at other times.

"The $8,000 investment in NetModem/Es saved us two to three hours per week, or about one man-month per year, of administrative time," he says. "A conservative estimate is that remote access paid for itself in less than two months, not to mention the time and aggravation that it saved."

SECURITY, MANAGEMENT

Access is one thing. Blocking out unwanted users is quite another. That is why network managers will want to look for products that keep proprietary information such as financial results, business cases, customer proposals and product designs secret.

Being able to authenticate remote users and secure the network resources were key security criteria for Charles Menser, a technician at PeachNet in Kennesaw, Ga. PeachNet is an Internet affiliate network in Georgia that supports 42 colleges and universities, as well as more than 200,000 users.

"A network of our size must consider four phases of security," Menser says. "A Kerberos server first authenticates the remote caller by user name and password, thus controlling access into the server. The next three steps are required by our large client base: verifying remote access permission to a specific campus location, granting permission to use specific protocols and determining if that user has any time restrictions on their connection."

Once these four steps have been completed, a remote user's access is defined and the accounting function, which logs the user and their activity, begins.

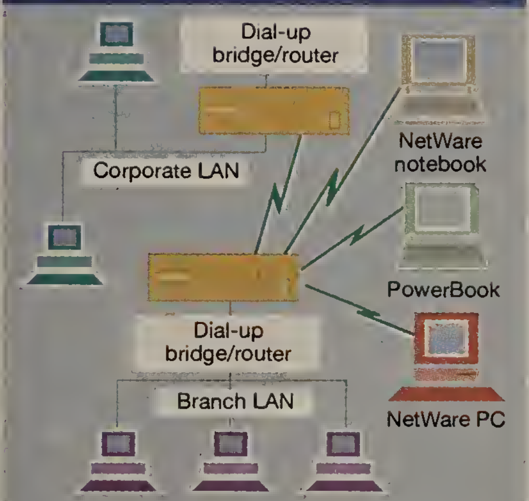
Remote LAN access product vendors are addressing these security concerns. "The key to remote access security is providing as many layers to supplement the network operating system as possible," said Marty Likier, director of LAN access products at Telebit in Sunnyvale, Calif.

An outer layer challenges client access to the remote server itself. Intermediate layers may provide cryptography or dial-back response. Once inside, the NOS' security takes over with its native logon and password mechanisms. In some cases, these various layers may be intertwined, incorporating elements of the NOS' security database into the overall security system.

Managers with Novell environments should consider products that integrate with NetWare's Bindery directory, which is the central nervous system for NetWare 3.X and earlier versions. Bindery contains a list of permitted users and all of their properties, such as passwords, network addresses and account balances.

Shiva's products take advantage of Bindery information, allowing end users to send their NetWare user identifications and passwords to the remote access server. The server then queries the Bindery residing on one of the NetWare servers, which validates the users' remote access. The advantage to users is a transparent logon sequence; the advantage to the network manager is one less user database to maintain.

Remote LAN-to-LAN access



Dial-up bridge/router establishes link with similar device at headquarters, making branch LAN-attached PCs and multiple remote PCs dialing in to it operate as though directly attached to headquarters LAN.

SOURCE: DIGINET CORP., BROOMFIELD, COLO.
GRAPHIC BY TERRI MITCHELL

There are other options for securing the headquarters LAN, starting with logon and password protection at the remote access server itself. Cryptographic handshakes make a calculation at the client and server ends, and both must match in order for access to continue.

Dial-back techniques accept the client's call, then disconnect the line and initiate another call from the server end. This feature is useful for reversing the phone charges and enabling the company to pay for the call. Unfortunately, it seldom works for travelers because most access servers accept only a predetermined return call number.

Novell's and Shiva's products are exceptions, however, because they accept Roving Callback numbers. Subnet filtering, available on Telebit's products, places fire walls between subnetworks and the remote client. For example, the accounting department and its financial records would be restricted to a need-to-know basis and would not be accessible to every caller.

While most security systems are proprietary, several dial-up security standards are available. One such system is the aforementioned Kerberos, a data security process developed at the Massachusetts Institute of Technology in Cambridge, Mass. Kerberos authenticates, or IDs, remote network users employing various forms of data encryption. Adding the element of encryption prevents passwords from being passed over the communications line, thus reducing susceptibility to hackers. Telebit's Netblazer uses Kerberos to tighten up its remote security.

Other security schemes are designed to support the Internet Engineering Task Force's Point-to-Point Protocol (PPP). The PPP is a standard way of encapsulating higher layer protocol information for transmission over serial lines. The Password Authentication Protocol (PAP) uses a two-way handshake with a password/ID pair to verify the identity of the peer at the other end of the link. The Challenge-Handshake Authentication Protocol (CHAP) is a more robust protocol, using a three-way handshake with a challenge/response protocol.

PAP is supported by Centrum, Rockwell and Shiva, among others. CHAP is supported by Centrum, Cisco, DCA, Rockwell and others.

Shiva's and Centrum's products have the option of working with third-party security systems, such as the SecurID card developed by Security Dynamics, Inc. in Cambridge. The SecurID card is a credit card-like device that contains a dynamically changing password synchronized to the remote access server. During logon, the user is prompted to enter the current password, which must be verified by the server in order for network access to proceed. The changing password is more secure than a fixed password.

Even when security works, managing remote access products is a major concern. Most products support SNMP, which enables managers to monitor and control all components of the remote access server, such as the main chassis and any attached modems or DSU/CSUs.

Some remote LAN access providers have written an SNMP-compliant private enterprise Management Information Base (MIB) for their products. Users must find out if those MIBs have been tested with such SNMP-based management systems as HP's OpenView or SunConnect's SunNet Manager.

SAVINGS ADD UP

When deciding which type of remote LAN access product to choose, users should know that dial-up internetworking hardware can pay for itself fairly quickly compared to more traditional leased-line connections between branch offices, according to Infonetics Research, Inc. in San Jose.

Continued on page 52

Outsourcing remote LAN access

Network managers looking for an easy way to add remote local-area network access to their networking arsenal might be wise to consider some new services about to be unveiled by several value-added network (VAN) and wireless service providers, as well as cable television companies.

These services will obviate the need for telecommuters, traveling employees and remote branch office workers to purchase special remote LAN hardware or software to access their corporate LANs. Instead, these workers will be able to use dial-up access to a service provider that will supply the link using its own infrastructure such as a Transmission Control Protocol/Internet Protocol router backbone or frame relay net.

Because VAN services are easy to implement and maintain, they provide managers with a turnkey solution that eliminates the headaches associated with selecting and upgrading hardware and software, supporting protocol conversion and ongoing net management.

Infonet Services Corp. this week is expected to launch its InfoLAN Switched Access Service, which will provide remote LAN access for telecommuters and travelers using the Point-to-Point Protocol. Infonet will rapidly expand the service internationally.

CompuServe, Inc. already announced it will offer a remote LAN access service but has yet to launch that service. The offering will enable users to access remote Novell, Inc. Internetwork Packet Exchange (IPX), TCP/IP and Network Basic I/O System LANs across CompuServe's X.25 packet network.

AT&T and BT North America, Inc. said they will roll out services that will enable users to access their frame relay nets for remote LAN access using native LAN protocols. Currently, the companies provide a gateway service that offers access to their frame relay or X.25 services via TCP/IP's Telnet virtual terminal protocol. AT&T also supports Serial Line Internet Protocol (SLIP) access to its frame relay and X.25 nets.

In addition to VANs, Bell operating companies, CATV companies and wireless carriers will play a large role in the market. The BOCs have an investment in Integrated Services Digital Network offerings, which promises to provide dial-up remote LAN access at a minimum of 64K bit/sec. With such speeds, ISDN could be the ultimate remote LAN access solution, but the service will not be available throughout the country until 1996 or 1997.

The rise in CATV/BOC alliances this year, including the Bell Atlantic Corp.—Tele-Communications, Inc. and Time Warner Entertainment—US West, Inc. deal last June, will give the cable companies access to telephone switching networks and subscriber management systems, as well as give BOCs the ability to enter CATV franchise areas outside of their operating territories. This will make them strong contenders to provide remote LAN access services to telecommuters.

Wireless vendors, on the other hand, are beginning to pair up with the interexchange carriers — most notably McCaw Cellular Communications, Inc. and AT&T — and will be especially strong servicing remote users who are dialing in from the road. Today's wireless nets still suffer from low-speed limitations, however, making them an unrealistic method for peer LAN access. These speed restrictions are anticipated to diminish by the late 1990s.

BY KITTY WELDON

Weldon, a data communications analyst at The Yankee Group, a research and consulting firm in Boston, can be reached at (617) 367-1000.

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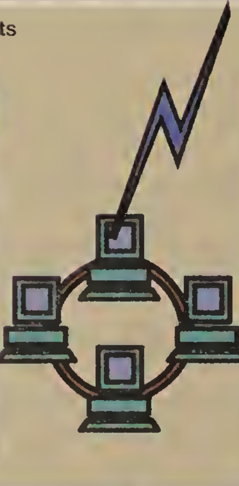
Reader views on remote LAN access

How many remote LAN access products do you have installed currently?

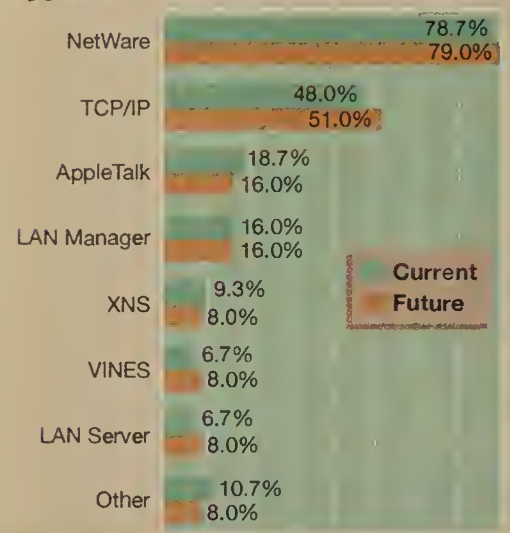
Number of products	Number of users
1	29
2	17
3	6
4	3
5	3
6	4
8	1
10	1
12	1
13	1
20	1
30	1
35	1



How many remote LAN access products will you buy in the next 12 months?

Number of products	Number of users
0	14
1	23
2	10
3	1
4	3
5	5
6	4
10	3
12	1
15	1
20	1
25	3
35	1
50	3

Types of remote LANs accessed



Remote LAN access selection criteria

Based on highest possible score of 10

Criterion	Importance rating	Satisfaction rating
Support for specific LAN protocols	8.83	7.52
Service/support	8.66	6.97
Throughput/ performance	8.54	6.78
Conformance to standards	8.47	7.46
Ease of use	8.42	7.12
Support for simultaneous sessions	7.41	6.52
Price	6.55	7.21

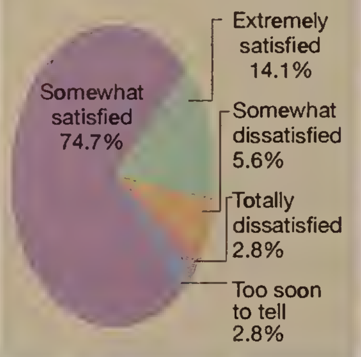
Key service and support issues

Weighted average based on highest possible ranking of 3

Toll-free hot line	1.50
Ease of installation	1.44
Free software upgrades	1.33
Next-day availability of parts	.84
On-site service as part of warranty	.48
Optional on-site service contracts	.24
Other	.11

Satisfaction levels

Reader satisfaction with remote LAN access products



The graphics on this page illustrate key findings of a recent *Network World*/ Focus Data, Inc. reader survey on remote LAN access products. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey and tabulated the results. The response base was 100. For more information, call Mona Dabbon at (508) 626-2556.

Buyer's guide

Continued from page 49

"The traditional financial model for remote LAN access has focused on the cost/benefits to the remote business traveler," says Michael Howard, president of Infonetics. "Another very significant benefit is available for LAN-to-LAN connections that do not require 24-hour-a-day service. For example, one hour of connectivity at 14.4K bit/sec with data compression is sufficient enough to transfer 60M bytes worth of files. When you compare the costs of one hour per day of dial-up time vs. a full-time, 56K bit/sec leased line, the savings over the period of a year are rather dramatic."

Eliminating the costs of dedicated leased lines became a major design objective for Cliff Winchester, a computer assistant for the U.S. Geological Survey (USGS) in Lansing, Mich. USGS installed Rockwell's Nethopper dial-up routers operating at 9.6K bit/sec to provide on-demand connectivity between the primary Unix-based Ethernet and two remote networks in satellite offices. The primary application requires peer-to-peer, bidirectional access to databases containing water usage statistics and quality reports.

"When we decided to upgrade our modem-based remote connections, we had two alternatives that would maintain our requirements for peer-to-peer connectivity: dedicated routers with leased lines or dial-up routing," Winchester says.

"Our traffic studies could not justify the monthly expense of the leased lines, but the dial-up solution was ideal. The connection process is fully automated, requiring less work for the end user than placing a modem call. From a circuit point of view, the dial-up routers are no more expensive than our modem-based access method. But we've gained full access to all networked applications."

THE EXPECTED HIDDEN COST

When it comes time to cough up the dough needed to buy a remote LAN access product, users should know that vendor pricing strategies vary with the product's architecture.

For hardware-based solutions, the number of wide- and local-area ports and scalability from small- to large-port models are two key areas to examine. Network managers considering software-based products need to know that expanding the operation will require the purchase of a centralized PC that will act as a remote access server for multiple remote nodes. In either case, the total turnkey cost of the system, including high-speed modems and additional phone lines, must be taken into consideration.

Another pricing issue is the way remote LAN access server vendors tag their client software. Some remote LAN access vendors allow unlimited copies of the client software to be distributed, while others charge on a per-user basis.

The need to pay for software for each client became a significant purchase criteria for Mike Neuburger, a network engineer at the University of Oregon in Eugene. "We evaluated several remote access products, and from a technical point of view, they were very similar," he says.

But after close examination, he found that the pricing strategies set the products apart. Some products charged per copy of the client software, while others based their price on the cost of the server hardware on a per-port basis.

"After asking our faculty and graduate students to supply their own high-speed modems, we couldn't ask them to also purchase a client software package," he says. Instead, the school found Centrum's pricing structure of a single price for unlimited usage to be reasonable.

STAY IN TOUCH

If network managers can choose the right product, then remote LAN access can squeeze more productivity out of every salary dollar. It also positions network managers for the future.

Plummeting costs for notebook computers, plus the new lines of personal digital assistants, will increase the popularity of mobile computing.

Higher bandwidth, lower cost digital transport, such as ISDN, will also add to the cost-effectiveness of this technology. Federal incentives, such as the Clean Air Act, will add fuel to the remote access fire by driving up the number of telecommuters needing access to remote LANs.

Thus, remote LAN access is removing the last barrier — the need to be directly attached to the physical cable plant at headquarters — that has impeded client/server computing. Now there is no excuse for staying out of touch with the headquarters LAN.

→ Contributing Editor Miller is president of DigiNet Corp., a Denver-based data communications engineering firm. His latest book, *Managing Internetworks with SNMP,* discusses SNMPv1 and SNMPv2 from the perspective of a network analyst or manager. Miller may be reached via the Internet at mark@diginet.com.

Letters

Continued from page 41

you think you deserve. Remember that many software companies actually do treat customers as though they have rights. And don't forget that you always have the right not to buy the product.

Regarding Mary Johnston Turner's column "LANs, not PBXs, will anchor user ATM implementations" (Aug. 2, page 32) and the letter to the editor from Danny Gmeiner ("Don't count out PBXs," Sept. 20, page 52):

LAN-PBX debate

It's not really productive to debate whether local-area networks or private branch exchanges will be the basis of future Asynchronous Transfer Mode (ATM) networks since neither concept, as it currently exists, is in any way a suitable platform. It isn't as though ATM is something that can be run on an existing 10Base-T LAN or PBX. ATM, if fully implemented, would *replace* current LAN hubbing, bridging and routing technology as well as current PBX switching technology.

Since both technologies could be replaced by ATM, there is the opportunity to consolidate the transport of voice, data and video. Whether or not this will be done will depend, as always, on cost. 10Base-T and token ring will continue to be used for years because they are cheap. Although today's PBXs are not designed to cost-effectively provide more than 56K to 144K bit/sec per port, it will be tough for a new technology to match the per-telephone port cost of a PBX.

Therefore, much the way ATM is used as a

See **Letters**, *page 53*

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Help desk

Continued from page 2

collection: batch Portable Data Terminals (PDT), which support periodic batch data transfers to a host; interactive fixed stations; and interactive Radio Frequency (RF) PDTs. Batch and RF interactive data collection hardware, middleware and software are provided by a number of vendors, including Telxon Corp., Symbol Technologies, Inc. and Intermec Corp.

Most implementations today use RF, and your requirement for RMS file access tells me that RF is the best for your needs because it provides instantaneous access to your RMS files for validating and processing transactions. For product information, call Telxon at (800) 800-8001, Symbol Technologies at (800) 722-6234 and Intermec at (800) 755-5505.

If you want to collect bar code data at fixed positions on the shop floor, Intermec's CrossBar hardware and middleware products provide a flexible (although proprietary) networked data collection system. CrossBar prices start at under $10,000 for the basic hardware and software requirements.

For communications processing and access to the VAX, we recommend you look at a PC solution running under Microsoft Windows. You can then buy or develop all the pieces you need to support communications to the PDT network and also directly query and process your VAX RMS files using third-party dynamic link libraries for capabilities such as Transmission Control Protocol/Internet Protocol communications and printing bar code labels.

For an integrated middleware solution, Eaglesoft's Transaction Server product provides message-based transaction handling to potentially multiple applications on multiple hosts. It is available for Microsoft Windows or Windows NT, and can serve PDTs from several vendors. It provides connectivity to VAXes, IBM mainframes, Application System/400s, most SQL server software products and local Windows applications. It costs $25,000. For product information, call Eaglesoft at (206) 682-4830. ☒

Letters

Continued from page 52

backbone for 10Base-T and token-ring data networks, one would expect to see ATM used as a backbone for PBX-based telephony.

In these early implementations, there may well be a single ATM-based black box that offers data connectivity via 10Base-T and token ring that can be terminated by current LAN equipment, as well as voice connectivity via channelized T-1 that can be terminated by current PBXs. Theoretical debates about whether this box is LAN equipment or a 99th-generation PBX will abound, but practically, only the type of manufacturer — LAN or PBX — that makes it will matter. Despite what manufacturers are saying about the capabilities of their existing products, virtually all are developing new lines to handle ATM.

Ms. Turner's warning that equipment should be aggressively depreciated should be taken seriously by LAN equipment purchasers as well as PBX purchasers. A corollary is: Buy commodity equipment that you can afford to write off quickly.

R.J. Murcek
Communications consultant,
Enterprise Consulting
CTG Communications Systems Practice
Buffalo, N.Y.

Video clarifications

Your Videoconferencing Buyer's Guide (Oct. 11, page 41) is timely, up to date and, for the most part, to the best of my knowledge, correct. However, it does include a few items which, in my opinion, need clarification.

First, as a member of the ANSI-accredited X3L3 Audio & Image Coding Standards committee and as a U.S. delegate to the ISO/IEC working group dealing with the Moving Picture Experts Group (MPEG) standard (which includes many of the same people that defined the H.261 specification, px64), I am aware that the H.261 specification was *not* designed with packet-switched local-area networks in mind.

All consideration was given to operating circuit-switched Integrated Services Digital Network services. Operation over other circuit-switched services is a welcome side effect. But it should not be surprising that operation over packet-switched networks is not supported very well.

The same can be said about MPEG-1 (which was not intended for videoconferencing at all) and most of the proprietary video compression algorithms used until now for videoconferencing. Hence, it is more correct to say that H.261 and most of the existing video compression algorithms are ill-suited to operate using the packet mode transport methods used on Ethernet and token rings, rather than "The packet mode transport methods used by Ethernet and token rings are ill-suited to the needs of video traffic," as stated in the sidebar "Video's last frontier" (Oct. 11, page 45).

There do exist video compression algorithms and encoding schemes that *are* better suited to operate over packet-switched local-area networks than H.261 and the established proprietary algorithms. The newest was announced this summer by Sun Microsystems, Inc. using its proprietary CellB algorithm. Another was announced last spring by ViewPoint Systems, Inc. using its proprietary Compressed Packet Video algorithm.

Second, the graphic "Video-to-desktop options" (page 45) suggests there is an unsolved problem when it states it is "unclear how [LAN-based] video will be sent over wide area." The solution is known and used by Sun, ViewPoint and InVision: It is simply Transmission Control Protocol/Internet Protocol. Compressed video is digital data. Packets of compressed video are treated in the same way by TCP/IP as other packets of digital data.

Third, the graphic suggests that there is a problem with interoperability when operating over LANs because the algorithms "are not H.261-compatible." But given that all nodes on LANs are programmable computers, interoperability can be achieved using the Compressed Video Interoperability (CVI) protocol. It is based on the fact that video decompression, including H.261, can be performed by software running on general-purpose personal computers, plus the concept used to deliver compressed ASCII data files, where the decompression is accomplished by software delivered with the data and loaded immediately before beginning to decompress the data.

The older, special-purpose, conference room videoconferencing systems and the new video phones may not support the CVI protocol concept, as they are not general-purpose programmable systems.

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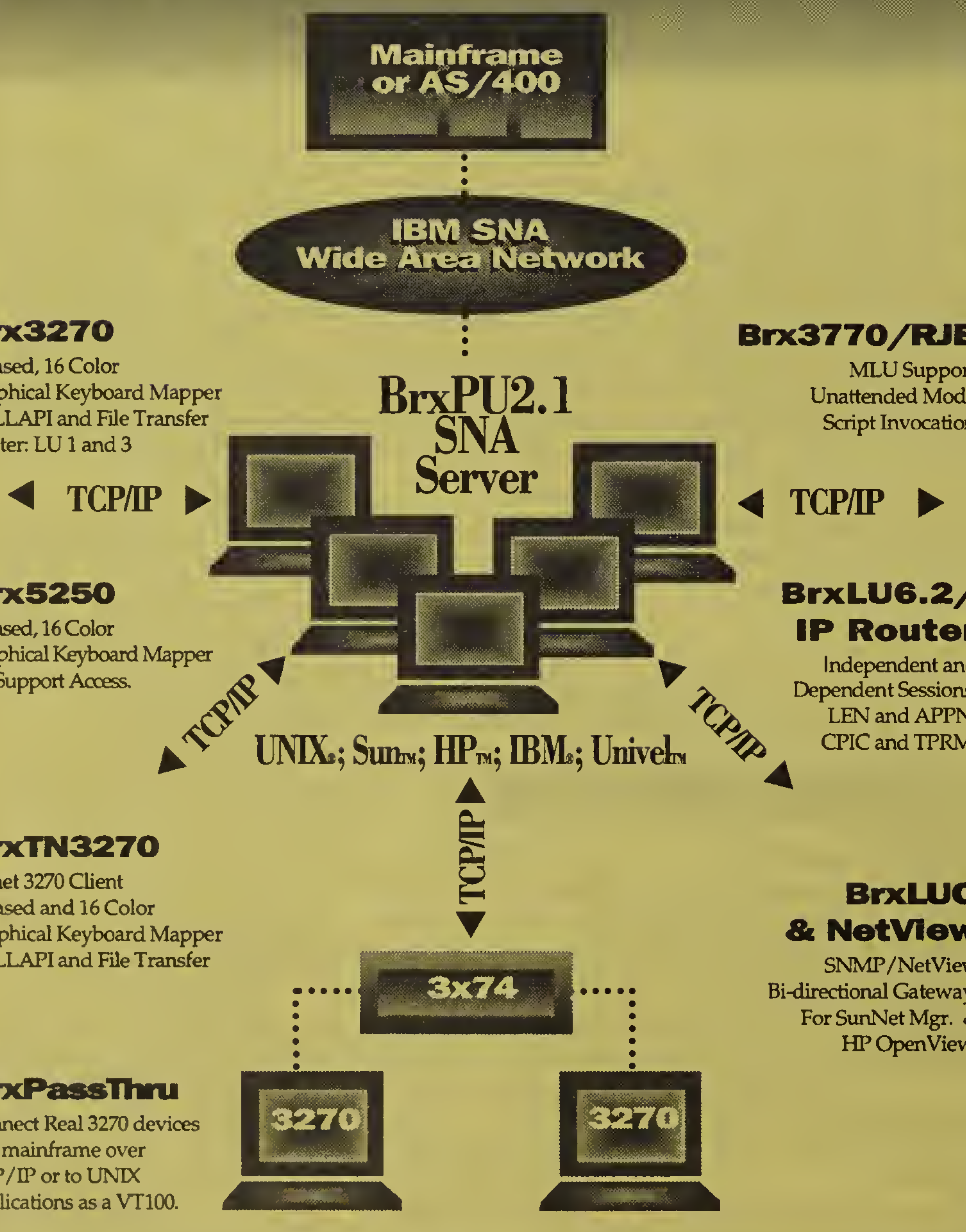

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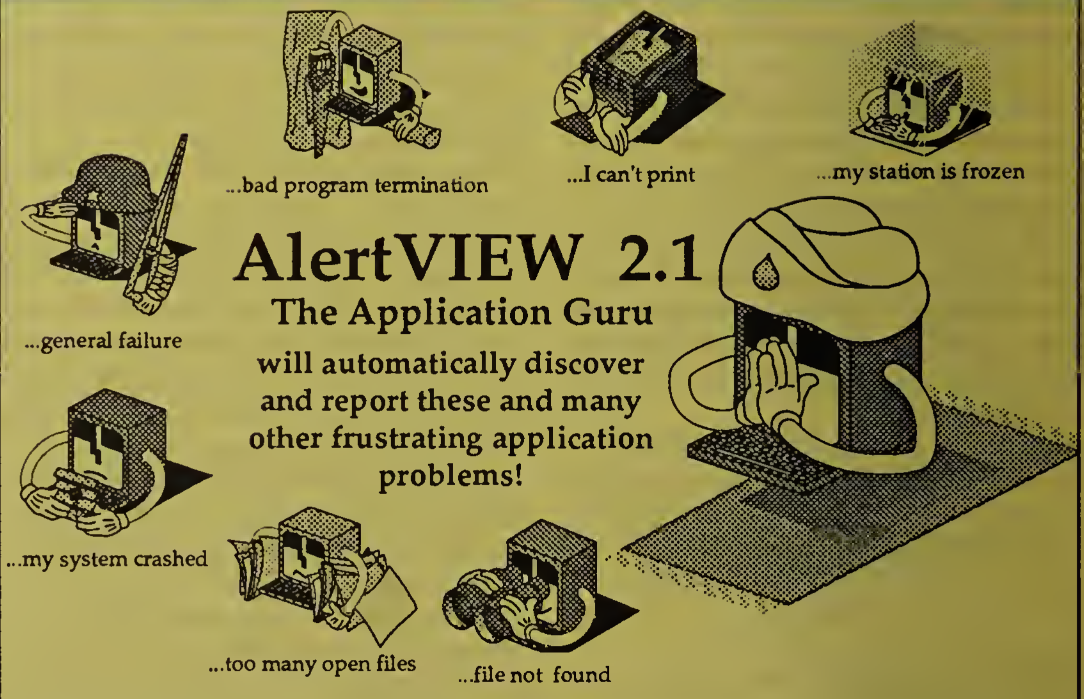

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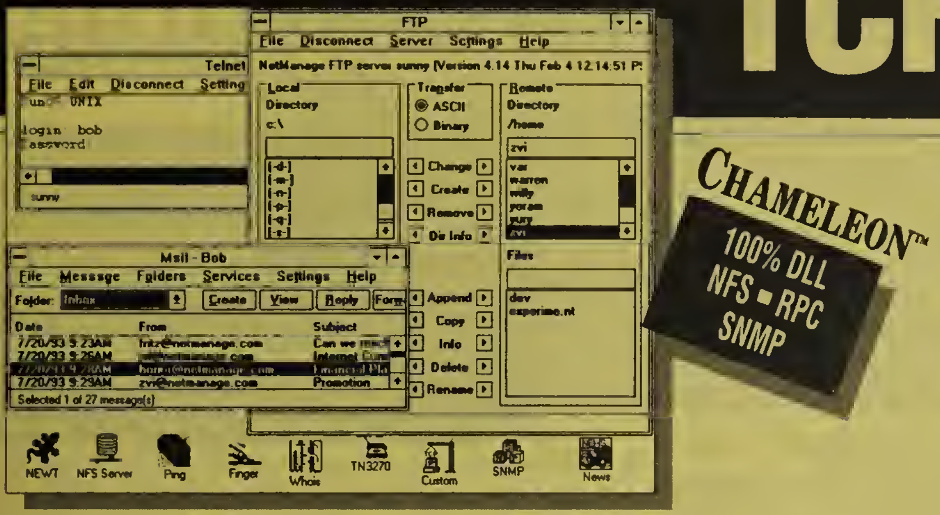

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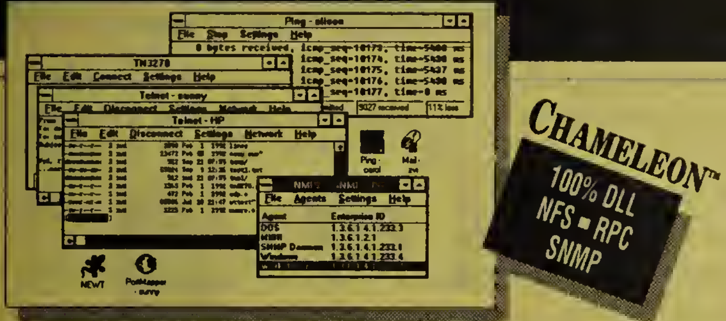

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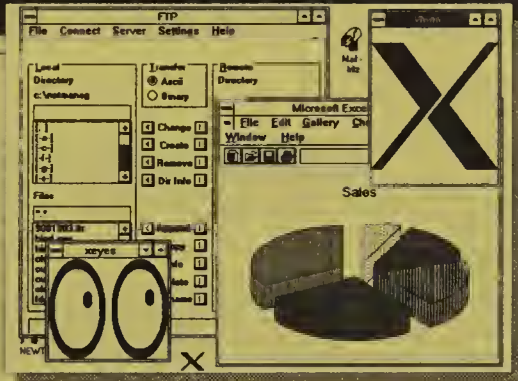

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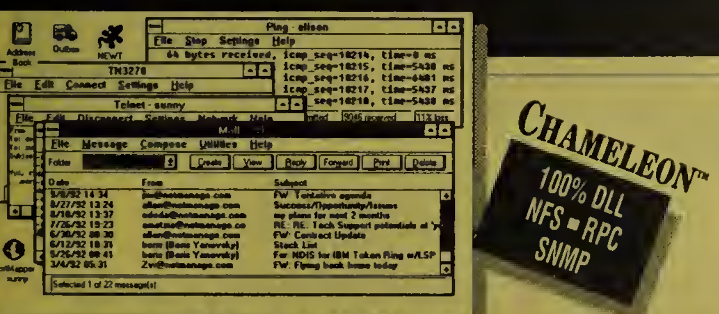

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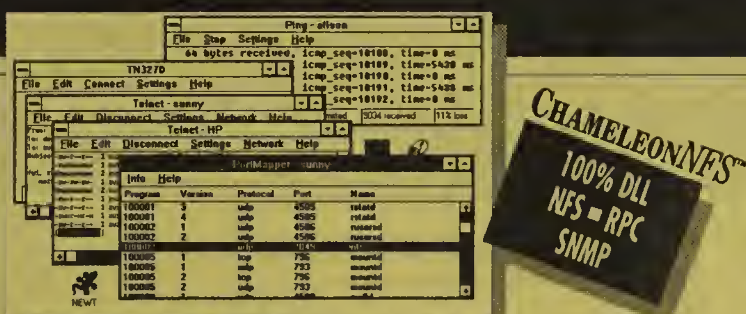

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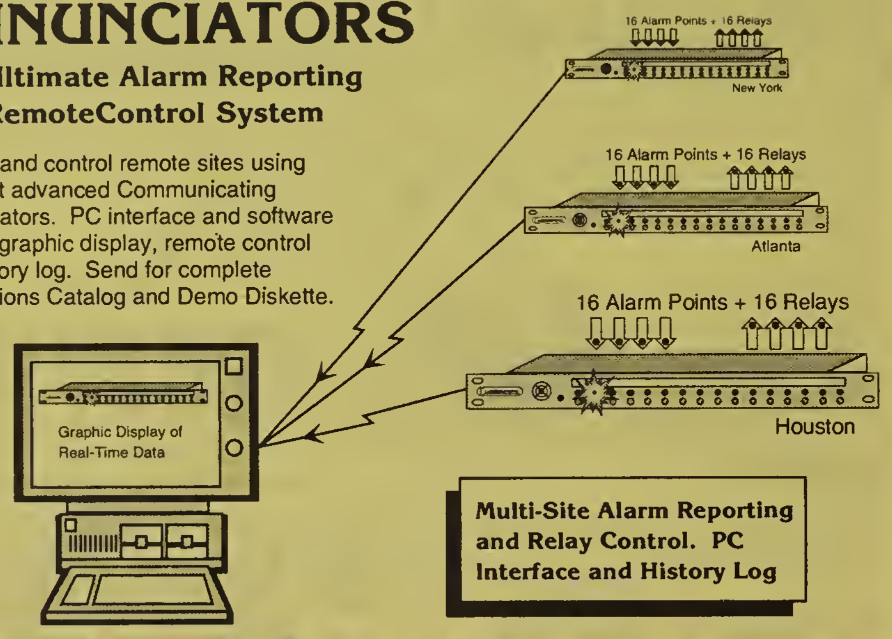
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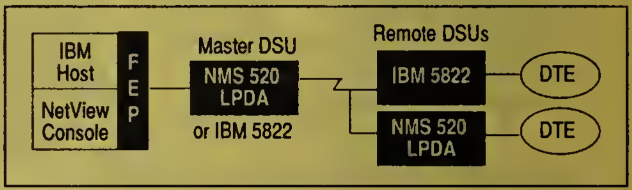

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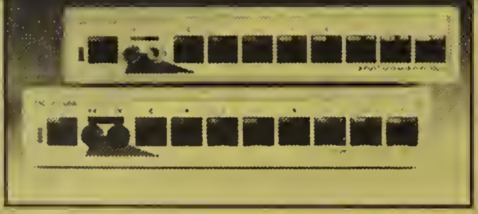

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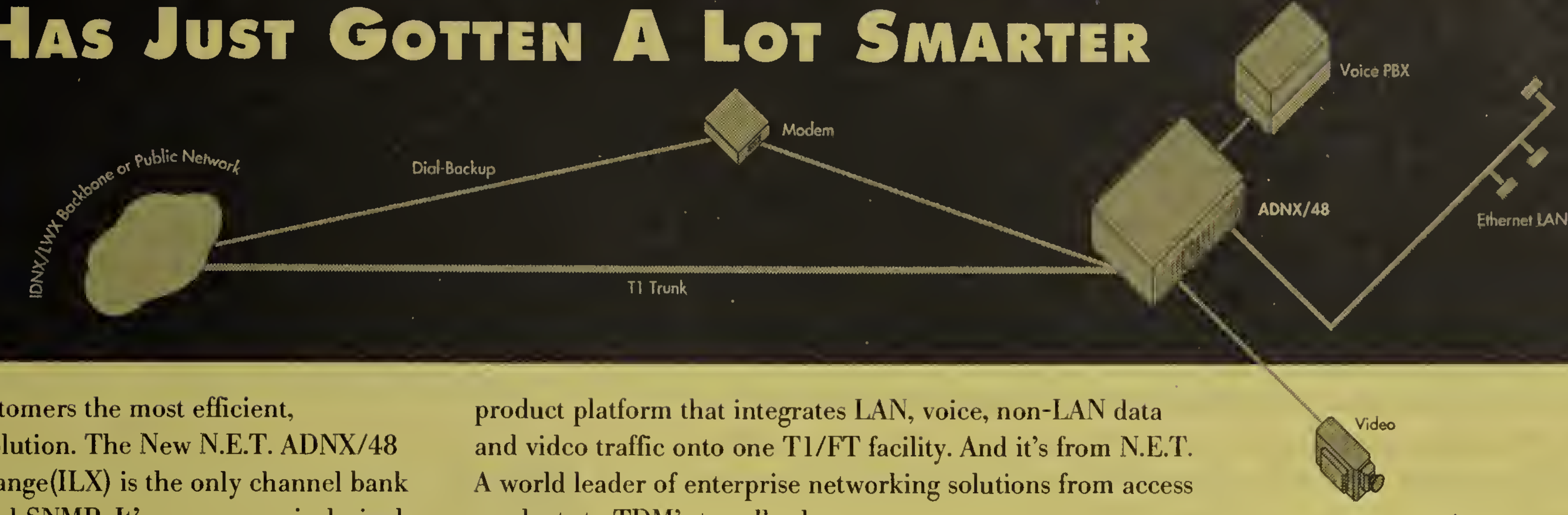

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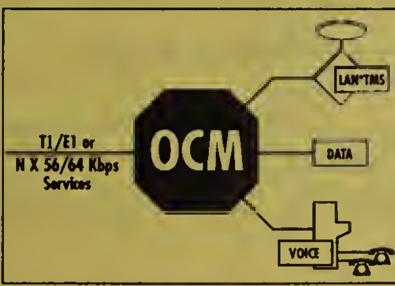

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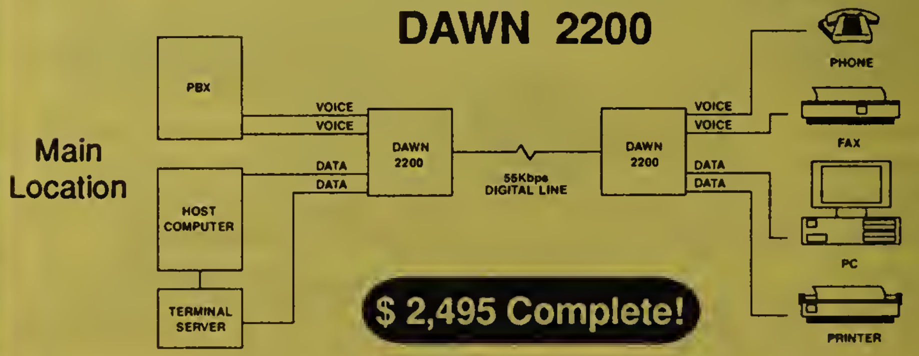

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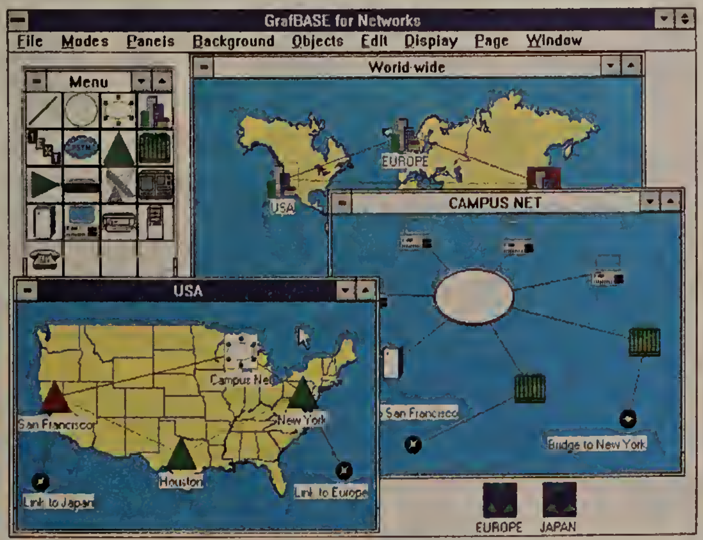

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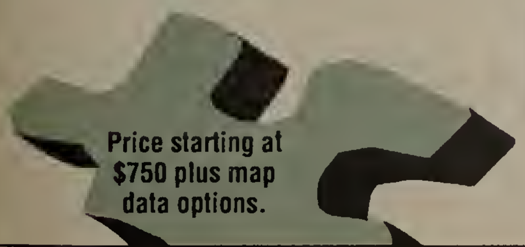

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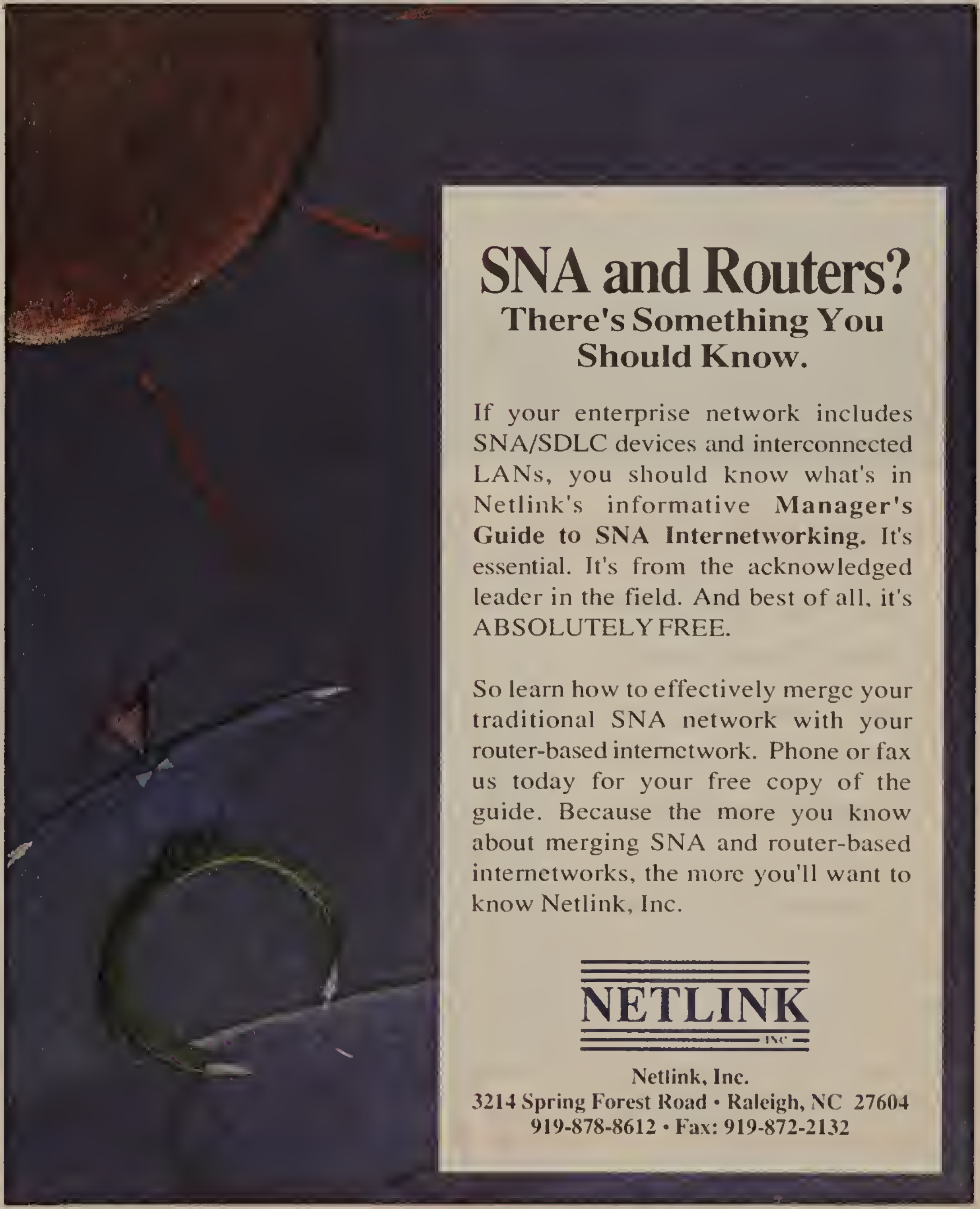

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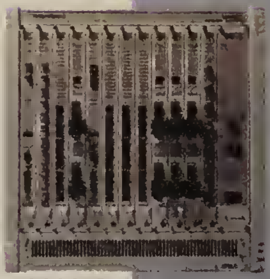

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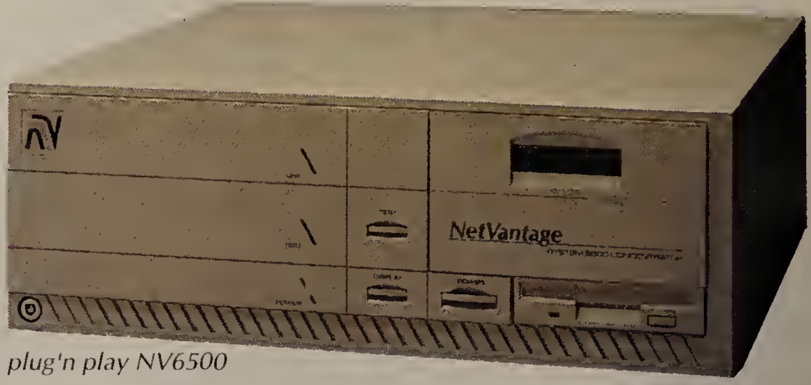

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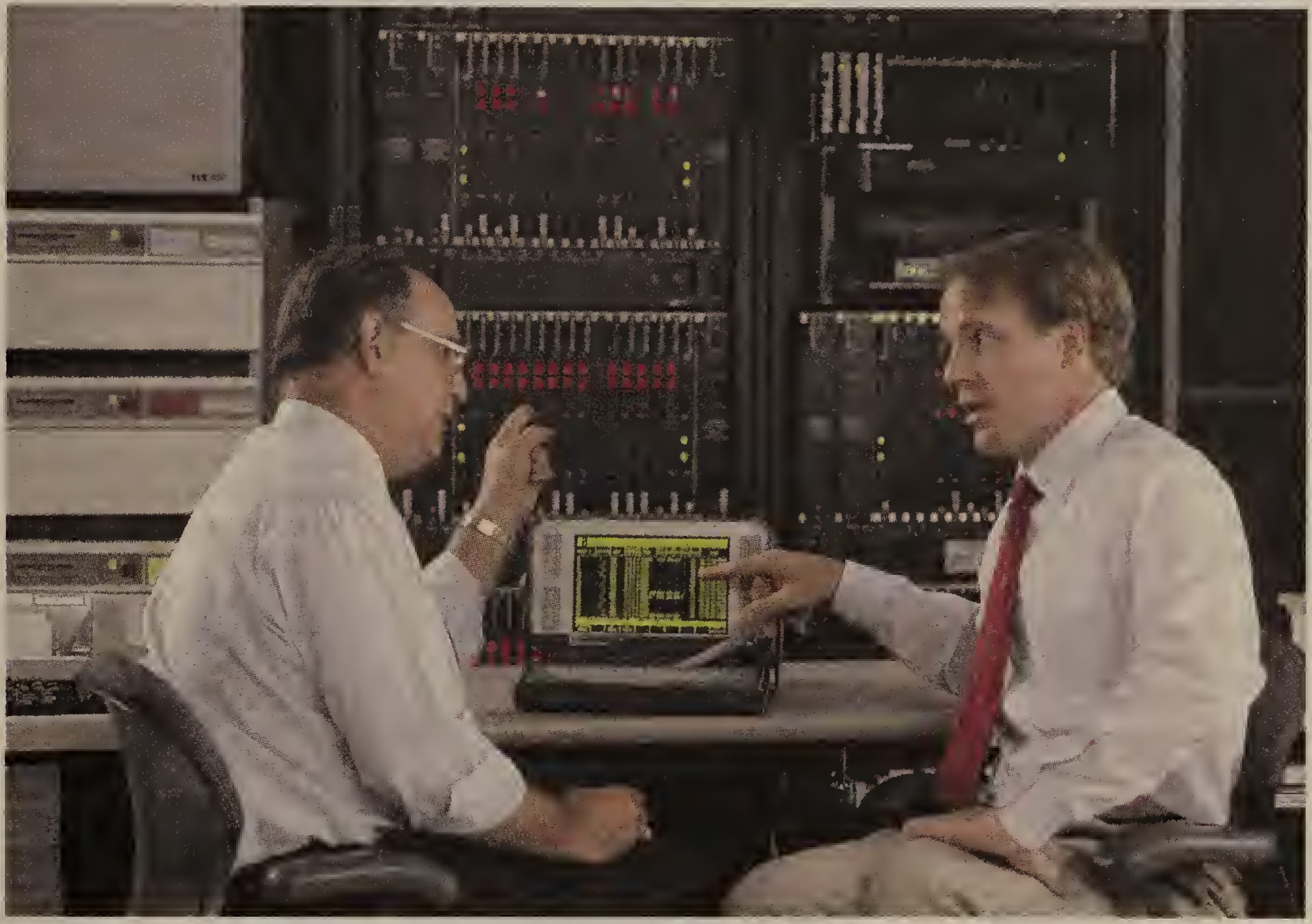

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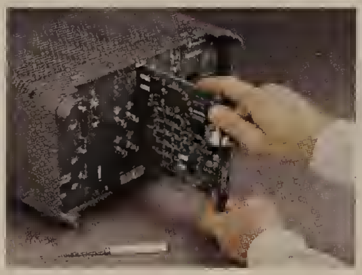

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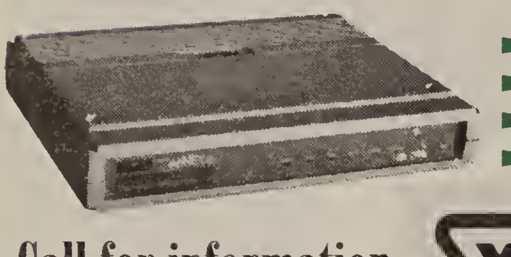

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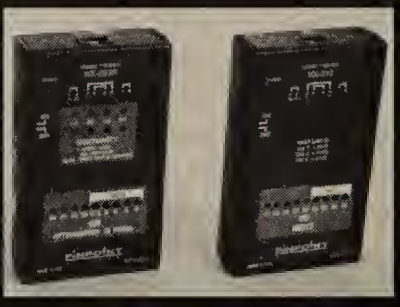

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RBHCs

Bells

Continued from page 1

Cellular Communications, Inc. and Bell Atlantic Corp./Tele-Communications, Inc. deals, *Network World* surveyed readers to find out whether they think current regulatory policies are out of touch with changing market realities.

With the RBHCs poised to play a key role in the information society of the future, users clearly feel it's time for a change. While they are dissatisfied with the level of competition in the local loop, network executives say current policies shaping the telecommunications industry are flawed and need to be revamped.

The telephone survey was conducted among 100 network managers, each of whom oversees the purchase of at least $500,000 in local and interexchange services and network equipment annually.

Nearly three-quarters of the users surveyed said the RBHCs should be allowed into long distance, with only 20% voicing opposition. RBHC entry into the CATV business was supported even more resoundingly, with 83% of the network executives approving the idea. A slightly higher percentage approve of RBHC provision of information services, while nearly 70% favor RBHC entry into equipment manufacturing. (see graphic, page 64).

The RBHCs are currently barred by the Modified Final Judgment from offering interexchange services, and the Cable Act of 1984 prohibits the carriers from offering cable programming in their own operating territories. The carriers are currently free to offer information services, although some legislators have voiced opposition to that.

Thomas Festa, a communications manager with Liberty Brokerage, Inc. in New York City, is among the users who favors RBHC entry into long distance — but only with conditions. "From a billing aspect, it would be a lot cleaner doing it that way," Festa said. But with New York Telephone Co. dominant in the local loop, he's worried about the fate of competitive access providers that are just establishing themselves and don't have New York Telephone's reach.

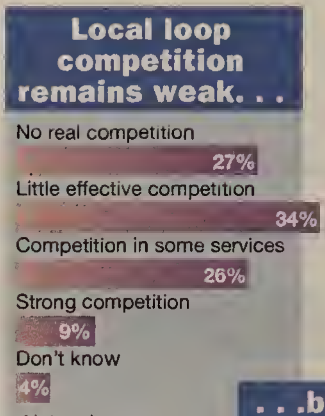
Ronald West, a senior manager of telecommunications and office automation at Shearman & Sterling, said he doesn't think there is much in it for the public. "I'm not sure how many more long-distance vendors are required and whether that's in the best interests of the ratepayers," West said.

Opponents of Ameritech, Bell Atlantic, BellSouth Corp., Nynex Corp., Pacific Telesis Group, Southwestern Bell Corp. and US West, Inc. have long held that the RBHCs' near monopoly control of the local loop warrants maintenance of the line-of-business restrictions.

But network managers do not appear to share that concern. Even though nearly two-thirds of those surveyed said the RBHCs face little or no real competition in the local loop, they think RBHC entry into new markets will spur competition and drive down prices. What's more, a third of users favoring RBHC freedom say it would lead to development of new services that could benefit their businesses. The managers also believe the change would improve the quality of services and equipment and boost overall research and development expenditures.

Although a solid majority favor RBHC entry into new lines of business, the prospect also drew some negative responses from customers who feel that the RBHCs have too much power and could stifle competition. Users also worry about the RBHCs cross-subsidizing new ventures with ratepayer money. Some respondents cited the RBHCs' misadventures in areas such as real estate as evidence that the companies should be kept out of markets they do not know. Another concern is the potential for conflict of interest, such as self-dealing on equipment.

Liberty Brokerage's Festa is one manager who opposes RBHC entry into manufacturing. Festa said the carriers benefit from working with outside suppliers. "Going outside their own realm allows them to come up to speed," Festa said. For example, when New York Telephone partnered with Newbridge Networks, Inc. in setting up enterprise networks, both companies benefitted, he said. Festa also thinks allowing RBHC manufacturing might tempt New York Telephone to repeat the self-dealing it's been charged with in the past.



Network managers were asked to rate the level of competition that exists in local loop services today.

THE FCC'S ROLE

The survey makes clear that network managers have soured on the current federal approach to telecommunications regulation. Nearly two-thirds of the managers survyed said federal policies covering the RBHCs are unclear and do not reflect today's marketplace realities. Managers feel even more strongly that it is time to rethink government policy on the RBHCs, with three-quarters calling for a review. Shearman & Sterling's West thinks it is time for the Federal Communications Commission and the U.S. Department of Justice to sit down and hash things out.

"The two [the FCC and the Justice Department] should make a ruling that states what the local operating companies can do, and then they can back off," West said. "I doubt you need much oversight beyond the purview of the FCC."

While West is clear on the FCC's role, respondents were divided on the issue of which institution should oversee the RBHCs. Users were split pretty evenly on whether oversight should be consolidated into a single agency. Among those who favor a single regulatory body, the FCC is practically the only organization under consideration. Four out of five say the FCC should oversee the RBHCs, and only a scattered few suggest other regulatory arrangements be considered.

But some users said establishing a single regulatory body would disrupt the balance of power and remove the checks and balances inherent in the current system. Also, some believe the telecommunications industry is too complicated for a single body to regulate.

The mere mention of government regulation seemed to elicit reflexive distaste in some managers. Discussing merging the oversight provided by the courts and the FCC into a single body led some managers to say the industry needed fewer restrictions, not more, and that the government had no place in business.

Competition in the local loop received a big "yes" from the managers, with nearly three-quarters saying the FCC should do more to promote competition. But few respondents seemed to have solid ideas on how to do that.

The most plausible advice on spurring competition was the suggestion that cable companies be allowed to provide telephone service. Others simply argued less regulation would serve to promote local competition.

A little more than half the respondents said cable company entry into the telecommunications business would benefit their companies, with nearly 40% disagreeing. About 50% of the users questioned whether CATV providers have the experience and resources to compete against established carriers.

Policy

Continued from page 1

What's more, influential industry segments and technologies — for example, television, cable TV and cellular communications — have evolved rapidly since it was passed. Most of the rules shaping the industry today were promulgated in the 1950s, '60s and '70s. For instance:

- Telephone companies, including the seven regional Bell holding companies, cannot own CATV systems in their own service areas. That decision came circa 1970-1971.
- Telephone companies cannot provide video programming.
- The RBHCs cannot manufacture equipment or provide long-haul services — a stricture imposed in 1982 in the Modified Final Judgment that settled the AT&T antitrust suit, which was filed in the fall of 1974 based on industry data collected primarily in the 1960s.

. . .but users think the RBHCs should be unshackled from restraints.

	Yes	No	In next 1-3 years	Don't know
Providing interexchange network services	74%	20%	3%	3%
Manufacturing and marketing of network equipment	68%	29%	1%	2%
Providing cable television services in their own territories	83%	8%	3%	6%
Providing information services	85%	13%	1%	1%

Respondents were asked whether the RBHCs should be allowed to enter business areas currently off-limits to them.

GRAPHIC BY TERRI MITCHELL SOURCE: *NETWORK WORLD*

These policies have contributed to some unintended developments that can be clearly seen today. Among other things, the RBHCs have focused a great deal of attention on international business opportunities because they believe they've been denied domestic business opportunities.

Conversely, international telecommunications service companies, such as BT (a part owner of MCI Communications Corp.) and Cable & Wireless Communications, Inc., are now big players in the U.S. telecommunications market.

In addition, if AT&T is excluded, foreign manufacturers such as Northern Telecom, Inc., Siemens AG, NEC Corp., Alcatel, N.V. and Ericsson dominate major portions of the U.S. telecommunications equipment business.

The Hollywood movie and program production industry, which provides the bulk of video entertainment domestically as well as overseas, is increasingly foreign-owned. Matsushita owns MCA-Universal, Sony Corp. owns Columbia Pictures Entertainment, Inc., Pathe Communications Corp. owns United Artists Entertainment Co. and Rupert Murdoch (who changed his nationality so he could own mass media properties) owns 20th Century Fox, several TV stations in major markets, an evolving TV network and several major newspapers.

WHO'S IN CHARGE?

Owing to the lack of an overriding vision, the major policy-making institutions appear more interested in fighting amongst themselves than in creating a future for the industry and the users that depend on it.

Take Judge Harold Greene, who has criticized the FCC and, at times, the states. Greene repeatedly charges that the regulatory establishment is not up to the task of overseeing the industry, with the implication that he, a single federal District Court judge, is.

A federal District Court in Virginia recently overruled a congressional ban on Bell Atlantic Corp.'s provision of video services, saying it violated the First Amendment and, in any event, was an egregious remedy for an alleged potential to abuse or exploit its market power.

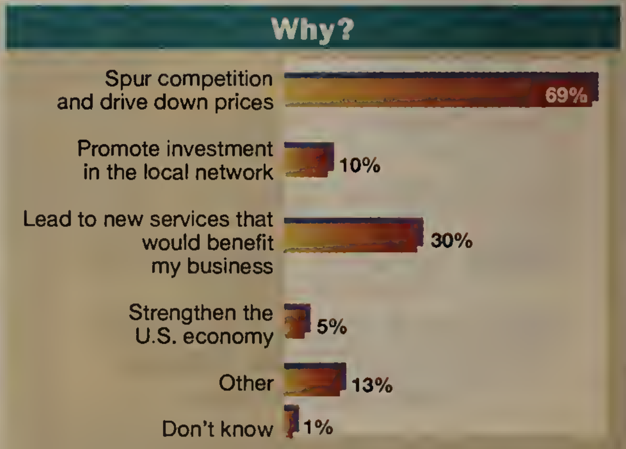
The court's decision was limited to Bell Atlantic because only that RBHC had the chutzpah to take on the U.S. Congress. Now every other telephone company in the country wants to join this case, which has been appealed by the Justice Department.

Other evidence of the contentious policy-making process includes the District of Columbia Circuit court's decision overturning the decade-old FCC Forbearance Doctrine. Under Forbearance, the agency gave smaller and newer competitors a break by freeing them from tariff filing obligations.

The increasing influence of the courts — and not the U.S. Congress — in policy-making has spurred politicians to threaten action. "Courts should not make telecommunications policy. Congress should," said Senator John Danforth (R-Mo.), a leading member of the Senate Commerce Committee.

Of course, that kind of language has been uttered before without any definite legislative response from Congress.

Lacking policy direction, the telecommunications industry has begun to take charge of its own destiny by merging, consolidating, cooperating and joint-venturing as never before. Examples of this consolidation and coopetition — to steal a phrase from



Users who favor the RBHCs' entry into new business areas were asked how it would benefit them.

GRAPHIC BY TERRI MITCHELL SOURCE: *NETWORK WORLD*

Novell, Inc. CEO Ray Noorda — include the massive AT&T/McCaw Cellular Communications, Inc. and Bell Atlantic/Tele-Communications, Inc. mergers (see story, this page).

Amid all this activity, the policy-making establishment has been largely relegated to the sidelines and left perplexed about how to get back into the game.

END TO THE IMPASSE

President Bill Clinton, Vice President Al Gore and top aides now claim that the policy impasse is about to end. The administration has a vision for the future: to create a high-performance information network to link every home, business, laboratory, classroom and library by the year 2015, and to put public records, libraries and educational materials on-line for public use. This is the information superhighway concept, developed and promoted primarily by Gore, a telecommunications policy enthusiast since his election to Congress in November 1976.

Who will be the drivers? The RBHCs and the other major telephone companies, at least according to Clinton-Gore insiders. But doesn't a policy keyed to the RBHCs require not just the abolition of the MFJ, but also some concrete legislative proposals? Doesn't it demand not just an updating of the Communications Act, but also dumping the legislatively mandated telephone company/CATV cross-ownership restriction?

For a growing number of people, the answer to these questions is yes.

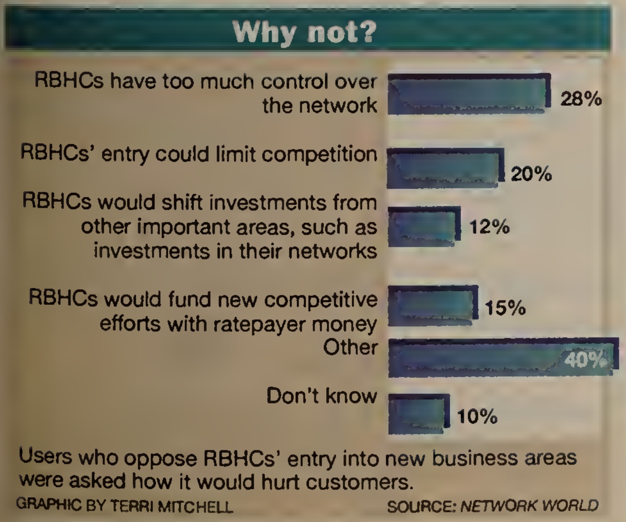
How is all that to be accomplished by a fractious and fragmented policy-making "infrastructure?"

One thing is clear: Gore can get the FCC in line. His longtime friend Reed Hundt is scheduled to take the helm soon as the new chairman, and — make no mistake — the FCC's major policy-making plays will be sent in primarily from the White House.

It's also clear that the vice president can get the Commerce Department and its National Telecommunications and Information Administration (NTIA) in synch. The president and vice president have ensured that by giving key telecommunications policy jobs to allies and friends who know the game plan and will carry it out.

Commerce Secretary Ron Brown, a point man on the information infrastructure project, says "trade, technology and telecommunications" are the important issues for the remainder of this decade — and "they are inextricably linked."

Larry Irving, the head of the NTIA and a friend of Gore, said, "The contours of the universal service concept must be expanded. This is a top priority. Our proposed legislation will attempt to create a universal service concept for the 21st century."

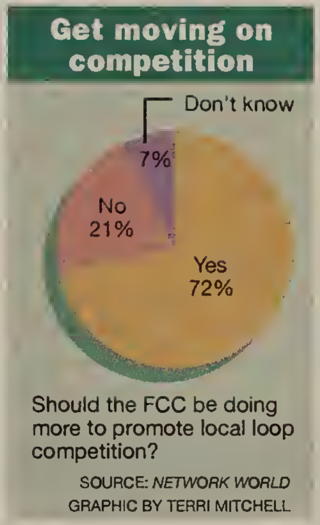


Users who oppose RBHCs' entry into new business areas were asked how it would hurt customers.

GRAPHIC BY TERRI MITCHELL SOURCE: *NETWORK WORLD*

One interpretation of Irving's views is that the telephone companies are best positioned to provide this new type of universal service to all of America. Washington doesn't trust the CATV segment of the industry at the moment largely because cable operators exploited the deregulation granted in the Reagan years by dramatically increasing rates while reducing service quality. The public got mad, and CATV drew the ire of Congress last year.

Gore still has clout on Capitol Hill, where he served in the House and Senate for 15 years, and may be able to get Congress to go along with the administration's policy proposals. Gore has powerful political allies on the Hill, including Rep. John Dingell (D-Mich.), chairman of the House Energy and Commerce Committee; Rep. Ed Markey (D-Mass.), chairman of the House Telecom Subcommittee; Sen. Ernest Hollings (D-S.C.), chairman of the Senate Commerce Committee; and Sen. Daniel Inouye (D-Hawaii), chairman of the Senate Communications Subcommittee.



Should the FCC be doing more to promote local loop competition?

SOURCE: *NETWORK WORLD*
GRAPHIC BY TERRI MITCHELL

Some of these telecommunications insiders sound just like Gore when they talk new policy. "We are not going to create a society of information haves and information have-nots," Dingell said. "That's not an acceptable public policy."

But Gore may also have his critics on the Hill, including Sen. Howard Metzenbaum (D-Ohio), chairman of the Senate Antitrust Subcommittee, and Rep. Jack Brooks (D-Texas), chairman of the House Judiciary Committee.

The White House, said one senior aide, wants to "remove the barriers that separate the different industry segments [and] abolish the MFJ because no one is interested in a policy announced in the early 1980s stemming from studies in the 1960s and early '70s." But Brooks and Metzenbaum are determined to remain vigorous enforcers of antitrust laws. The debate here will focus on old policy vs. new policy and whether the FCC is up to regulating the unbound RBHCs that are already showing signs of going on a spending and acquisition frenzy.

WILD CARDS

But there are some wild cards in the policy-making game that make gambling on a cohesive policy initiative risky.

Greene, appointed for life and holding down a comfortable $133,600-a-year job, wants to retain his grip on the RBHCs' destinies and to limit their "market power," which he regards as significant.

He may be joined in the not-too-distant future by Anne Bingaman, the newly appointed assistant attorney general for antitrust. Said a Bingaman aide: "The age of laissez-faire under Reagan-Bush is over. Mergers and consolidations that have been ignored in the past are going to come under serious scrutiny. And if it's a close call, Bingaman will intervene."

Bingaman has already litigated successfully against BellSouth Corp. and US West, Inc. on what are called negative (or reverse) option contracts. During discovery and depositions, she apparently learned a great deal about how the telecommunications industry operates — at least at the RBHC level — and didn't like everything she saw.

At least some state regulators may also have to be convinced that a new industry-wide policy must be enunciated and enacted in the next 12 to 18 months.

From today's perspective, the Clinton administration looks to be on the right track for the industry and users. It is currently attempting to get its policy-making ducks in order prior to the development of an industry policy package (read vision) that will be sent to Capitol Hill sometime this winter or in the spring.

Then the policy battle will begin within the policy-making establishment and the different industry segments. This administration may be better equipped than others to deal with the challenges of establishing a vision, largely because the public is beginning to understand that an information policy is necessary and an information infrastructure will play a vital role in this country's economic and technological future.

The Clinton-Gore thrust will cover four major — and closely related — areas:

■ The development of policies to encourage construction of the $450 billion information superhighway. There will be a heavy reliance here on the resources of the RBHCs and other major telephone companies, such as GTE Corp./Contel Corp.

■ The rewriting of the Communications Act of 1934 to bring it up-to-date with today's "technological, marketplace and competitive realities and imperatives."

■ The removal of barriers that separate the different industry segments, including abolition of the MFJ.

■ The reduction of state regulatory authority so Washington's policy-making establishment can have greater control over the industry's destiny. Currently, state regulators have the ability — and, often, the incentive — to thwart national and international policies.

Legislation significantly amending or changing the Communications Act of 1934 will go a long way to reducing the influence of the courts, which have tended to interpret the act somewhat rigidly, thus denying the FCC and others any policy-making flexibility. The administration's policy proposals should, and probably will, include dumping the MFJ and getting rid of the influence of Judge Greene.

All of this is not to say that the Clinton-Gore proposals will be a slam dunk on the Hill. Many opponents from within the policy-making fraternity and the industry will emerge with all the strength and fortitude that money can muster. And 1994 is an election year.

But Clinton and Gore want to move ahead with an industry that is integrally important to this nation's future. That can only benefit users.

➻ Pearce is a contributing editor for *Network World* and president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C. He can be reached at (301) 320-3608.

Mega-merger mania

While telecommunications policy may be stagnant, the network industry itself is undergoing radical transmutations as the lines between once-distinct market segments dissolve.

The $20 billion Bell Atlantic Corp./Tele-Communications, Inc. (TCI) deal — which is a coming together of one of the U.S.'s largest telephone companies with the largest cable television, video programming and mass entertainment-information conglomerate — is being billed as one of the five biggest consolidations in the history of U.S. business.

The public policy ramifications of the deal are so profound that the Washington, D.C. political establishment is almost speechless — something that never happens in the nation's capital.

There's also a colossal battle going on for Paramount Communications, Inc., a movie, program production and mass media entertainment company.

On one side, you have the team of Viacom, Inc., Blockbuster Entertainment Corp. and Nynex Corp. bidding.

And on the other side you have the QVC Network, Inc.-TCI-Liberty Media Corp. alliance and perhaps even another regional Bell holding company (not Bell Atlantic). These two consortia are locked in a bidding war for Paramount that values the company somewhere between $8 billion and $11 billion.

Consider also these boundary-bluring maneuvers:

■ AT&T's takeover of computer giant NCR Corp., at a price tag of $7.5 billion, and now McCaw Cellular Communications and LIN, the wireless communications giants.

A factor of AT&T's $12.7 billion bid for McCaw that has gone almost unnoticed is that McCaw owns more than 50% of LIN, a wireless communications and broadcasting conglomerate.

McCaw has an option to buy the remainder of LIN but has not had the funds to do so — until AT&T came along.

If AT&T is successful in acquiring McCaw, which seems likely, it may also gain entry into the broadcast TV business and may soon enter cable TV.

■ GTE Corp.'s acquisition of Contel Corp. for $6.6 billion.

■ BT's $4.3 billion investment for 20% of MCI Communications Corp., the U.S.'s second largest long-haul carrier.

■ Pacific Telesis Group's $3 billion acquisition of Cellular Communications, Inc.

■ Sprint Corp.'s buyout of Centel Corp. for $3 billion.

■ Bell Atlantic's acquisition of Metro Mobile cellular for $2.5 billion.

■ The purchase by TCI and Cox Enterprises of Teleport Communications Group, Inc., a competitive access provider, for an undisclosed amount. The pair sold minority stakes to two other cable TV companies, Comcast Corp. and Continental Cablevision.

■ Southwestern Bell Corp.'s deal for two Washington, D.C.-area cable TV systems for $650 million.

All of this bidding activity may prove to be only the tip of the iceberg as other cable, entertainment and computer/communications companies race toward partnership in the wake of the Bell Atlantic/TCI deal.

BY ALAN PEARCE

NetWare/IP debuts

Novell, Inc. is expected to release NetWare/IP this week at INTEROP Europe. Discussed earlier this year at Novell's BrainShare '93 developers' conference in Salt Lake City, NetWare/IP will let users run NetWare over native Transmission Control Protocol/Internet Protocol (*NW*, March 29, page 1). Today, customers have to use Novell's Internetwork Packet Exchange (IPX) protocol. The product will consist of both client and server components. The client piece will provide a local TCP/IP protocol stack and additional connectivity tools found in Novell's LAN WorkPlace product. Customers that have LAN WorkPlace will not need the new NetWare/IP client. On the server, NetWare/IP will consist of a set of NetWare Loadable Modules (NLM) that will let existing NLMs and application program interfaces work within a TCP/IP environment. It will also provide a gateway to let IPX-based systems communicate with NetWare/IP pro] NetWare/IP ranges in price from $500 for a five-user version to $14,500 for a 1,000-user version.

NetWare

Continued from page 1

4.X extends to other areas, it is backup that users cite as the key requirement for large 4.X implementations.

"Backup is really the only thing that is important to us at this point," said one user who requested anonymity. "We have more than 200 servers and our current backup utility does not support 4.X. We'd be foolish to go to production with something we can't back up."

The three leading backup vendors — Cheyenne Software, Inc., Legato Systems, Inc. and Palindrome Corp. — are hearing users' cries and are getting ready to bring out new 4.X-based products.

All three vendors are currently shipping products that will back up NetWare 4.X nets using a scheme derived from the NetWare 3.X bindery. The scheme lets users back up specific objects based on their object ID, which is what the NetWare bindery uses to keep track of files and other resources.

But NetWare 4.X no longer uses object IDs. Instead, the new NetWare Directory Service (NDS) is based on a tree structure that defines departments, for example, then users in each department and the access rights each user has to various resources.

So a backup product that uses bindery emulation could back up a specific file, for example, by assigning it an object ID. But such a system has no way to define all the profiles that describe user access rights, privileges and relationships as described by the directory service.

"If you don't back up the directory services, you can back up the data, but you can't back up the user [profiles]," said Stuart Beckett, director of technical services at Burkey & Associates, Inc., a system integrator in Columbus, Ohio.

"Sure, a lot of the companies do bindery emulation, but that does no good with NDS' tree structure," the anonymous user added.

But that is about to change, according to Randy Littleson, director of product management at Palindrome, based in Naperville, Ill.

"Next month we plan to ship a new version of our base product that will not use bindery emulation and will be able to back up all aspects of directory services, including users and security rights," Littleson said.

The new product, dubbed Network Archivist SMS 3.0, will cost the same as the company's existing Network Archivist 3.0 product — $1,695 — and will have similar features. The primary difference will be full compliance with Novell's Storage Management Services (SMS), which provides for complete directory services backup.

Littleson said the product is two-thirds through the beta process and is expected to be available by the end of November.

Ray Bayer, director of product management at Cheyenne, based in Roslyn Heights, N.Y., said his company this week will begin shipping an upgraded version of its ArcServe 5.0 product that will be able to back up NDS information without using bindery emulation.

"We now have Version 5.0a that backs up the NDS through SMS," Bayer said. "This will be a free upgrade to our current customers. It will basically be a maintenance release."

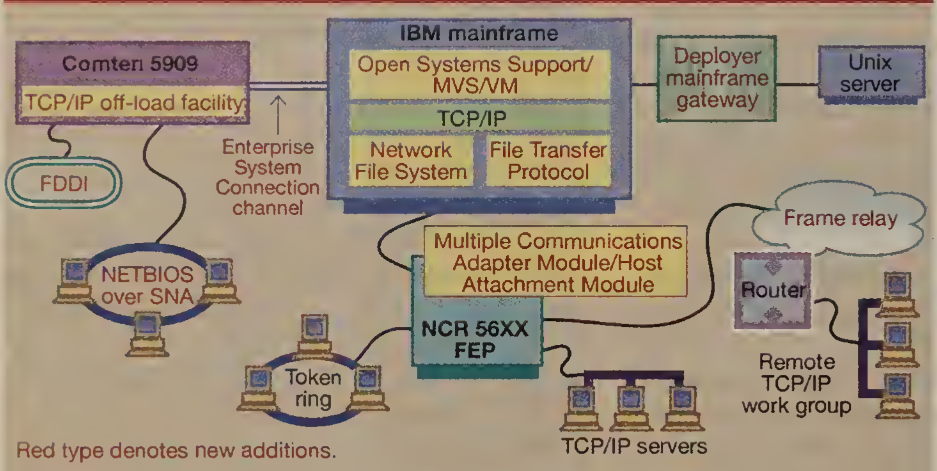
Version 5.0a will cost the same as the company's existing 5.0 version, starting at $395 for a five-user version, to $2,395 for a 250-user version. He added that the company has not publicly announced the product, but rather sent out postcards to its customers telling them how to get the updated version free of charge.

Legato Systems will be the last of the three to provide full NetWare 4.X backup capabilities, with products expected to ship by the end of January, according to Ed Cooper, vice president of marketing at Legato, based in Palo Alto, Calif.

NetWorker and NetWorker Advanced Versions 3.0 will not only be able to back up 4.X nets, but also NetWare 2.X and 3.X nets, so customers upgrading to NetWare 4.X will still be able to back up their older nets with the same product.

NetWorker 3.0, the workstation version of the backup product, will be priced the same as the current 2.2 version starting at $750. NetWorker Advanced 3.0, the server version, will be priced about 10% higher than the current price, from just under $2,500 to more than $8,000.

NCR breaking out



Red type denotes new additions.

Enhancements and additions to NCR's mainframe, FEP and mainframe gateway products will give users new TCP/IP networking capabilities, including support for frame relay and a Unix-specific mainframe gateway.

GRAPHIC BY SUSAN SLATER

SOURCE: NCR CORP., ST. PAUL, MINN.

NCR

Continued from page 1

Unix TCP/IP servers to be channel-attached to an IBM mainframe. The box is similar to NCR's 5909 LAN-to-mainframe gateway, except it supports Unix servers via a Small Computer System Interface (SCSI) rather than across a local-area network.

Deployer is designed to set up a conduit between the mainframe and Unix servers that will support high-volume file transfers using the File Transfer Protocol, NCR said.

Using an SCSI interface instead of a LAN attachment should improve the Deployer's performance over the 5909 gateway, which attaches token-ring and Ethernet LANs to an IBM or compatible mainframe channel.

But NCR promised 5909 enhancements, as well, including improved TCP/IP support.

The 5909 will next year receive a TCP/IP off-load function, enabling it to handle most TCP/IP protocol processing for the host. The company said it will also add a Simple Network Management Protocol agent so the box can be managed by any industry standard SNMP manager.

NCR is playing catch-up in the TCP/IP off-load arena since IBM, McDATA Corp. and Network Systems Corp. already offer the feature on their respective platforms that compete with the 5909.

"Moving TCP/IP out away from the mainframe is a critical part of NCR's new strategy," Santisario said. "How well they do it and how well users accept it will go a long way in determining the company's success."

Other planned enhancements for the 5909 include support for Fiber Distributed Data Interface LANs plus Network Basic I/O System and Novell, Inc.'s Internetwork Packet Exchange (IPX) protocol. NCR is also promising to deliver a Systems Network Architecture gateway and Enterprise System Connection channel support to the 5909.

FEP FEATURES

For its 56XX FEP, NCR will introduce a new Multiple Communications Adapter Module/Host Attachment Module (MCAM/HAM), which will let users on Ethernet or token-ring LANs linked to the 56XX access TCP/IP and SNA applications on the mainframe.

NCR's previous version of MCAM allowed TCP/IP data pass through the 56XX, enabling TCP/IP-based nets to be interconnected via an SNA backbone, but did not let TCP/IP users access resources on the mainframe.

"The ability to simultaneously access TCP/IP and SNA applications on the mainframe is strategic for us," said one user who attended the conference. "We have a huge SNA installed base, but we are rapidly adding LANs and multiprotocol applications."

The MCAM/HAM is expected to ship in early 1994.

Also for the 56XX, NCR said it will add frame relay data terminal equipment (DTE) support, which will let users attach the 56XX to frame relay services. That will still leave the 56XX about two software releases behind IBM's FEPs, which have both DTE and data communications equipment support, letting users not only attach the FEP to frame relay services, but also build private frame relay nets.

The company said it is considering adding Data Link Switching (DLSw) support to the 56XX. DLSw is IBM's technology for routing SNA and NETBIOS traffic over TCP/IP backbones.

For the host, NCR will enhance its MVS TCP/IP application — Open Systems Support (OSS) — to include TCP/IP's FTP. The feature will give the mainframe support for Deployer as well as TCP/IP file transfers.

AND MORE FEATURES...

NCR will also add a new service that will let TCP/IP and SNA users linked to OSS applications employ the same printers.

OSS will also receive Network File System (NFS) server support, which will let NFS clients store data on the mainframe.

"NCR has some good TCP/IP products for the mainframe, but they are some of the best kept secrets in the industry," said a user who requested anonymity.

NCR executives declined to comment further on the products. Pricing was not available.

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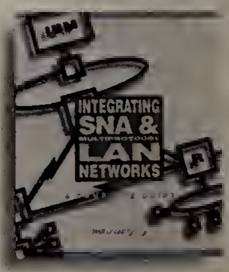

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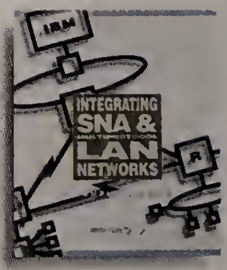

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	SESSION 1 9:40 am - 10:40 am	SESSION 2 11 am - Noon	LUNCH Noon - 1:30 pm	PLENARY SESSION 1:30 pm - 2:30 pm	SESSION 4 2:50 pm - 3:50 pm	SESSION 5 4:10 pm - 5:10 pm
EDI MANAGEMENT	IT Re-engineering for Inter-corporate Communications	Strategic Planning for EDI	Luncheon	Executive Panel	When to Outsource Your EDI Program	Understanding EDI Standards
E-MAIL I	Messaging Overview	Directory-Based Mail Integration			Value Added Networks for Electronic Messaging	Mail-Enabled Applications
EDI	Selecting a Value Added Network	Selecting EDI Software			X.400, X.435, & EDI	Integrating EDI, E-Mail, Forms & BBSs into Electronic Commerce
E-MAIL II	E-Mail Case Study: Multi-Platform E-Mail	E-Mail: Mainframe, LAN or Client Server?			MultiMedia Mail	X.500 Directory Service Trends
GROUPWARE/ WORKFLOW	Electronic Communication and Workflow	Notes: What is it?			Investing in Workflow Based Groupware	Forms-Based Workflow Automation
SPOTLIGHT SESSIONS	Brainstorming Session #1: The Future of EDI				Document Exchange Technologies	Selecting Software for Electronic Commerce

Tuesday Registration 7:30 am - 5 pm • E-Comm Exhibit Hall Open 8 am - 6 pm

WEDNESDAY, DECEMBER 1st

	SESSION 6 8:30 am - 9:30 am	SESSION 7 9:50 am - 10:50 am	SESSION 8 11 am - Noon	LUNCH Noon - 1:30 pm	SESSION 9 1:40 pm - 2:40 pm	SESSION 10 3:00 pm - 4:00 pm
EDI MANAGEMENT	EDI-II: The Next Generation	Developing an EFT - EDI Strategy	EDI, Networking and OSI	Luncheon	Creating an EDI Architecture	Advancements in EDI Translators
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GROUPWARE/ WORKFLOW	Group-Enabled Applications	Workflow and Electronic Commerce	Selecting a Workflow Product		Messaging, Groupware and Wireless Communications	The Future of Groupware and Workflow Automation
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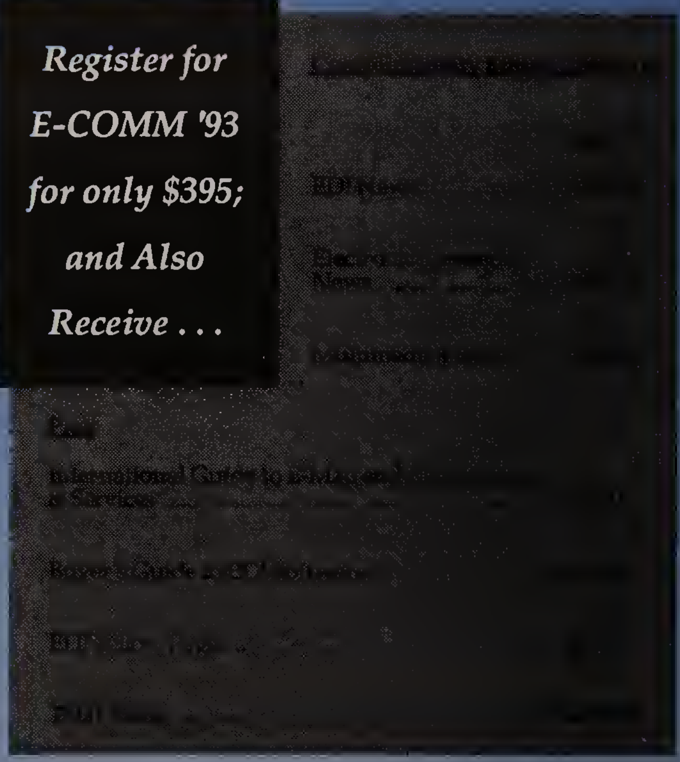

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